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SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 46.

THE MYRIAPODA OF NORTH AMERICA.

BY

CHARLES HARVEY BOLLMAN.

EDITED BY

L. M. UNDERWOOD.

[Containing the collected writings on North American Myriapoda, both published and unpublished, of the late C. H. Bollman.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

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This work (Bulletin No. 46) is one of a series of papers intended to illustrate the collections belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

The publications of the National Museum consists of two series—the Bulletin, of which this is No. 46, in continuous series, and the Proceedings, of which the sixteenth volume is now in press. A small edition of each paper in the Proceedings is distributed in pamphlet form to specialists in advance of the publication of the bound volume.

The Bulletin of the National Museum, the publication of which was commenced in 1875, consists of elaborate papers based upon the collections of the Museum, reports of expeditions, etc., while the Proceedings facilitate the prompt publication of freshly-acquired facts relating to biology, anthropology, and geology, descriptions of restricted groups of animals and plants, the discussion of particular questions relative to the synonymy of species, and the diaries of minor expeditions.

Other papers, of more general popular interest, are printed in the Appendix to the Annual Report.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

Papers intended for publication in the Proceedings and Bulletin of the National Museum are referred to the Committee on Publications, composed as follows: T. H. Bean (chairman), A. Howard Clark, R. E. Earll, Otis T. Mason, Leonhard Stejneger, Frederick W. True, and Lester F. Ward.

S. P. LANGLEY,
Secretary of the Smithsonian Institution.

WASHINGTON, *August 31, 1893.*

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I.

INTRODUCTORY NOTE.

SIR: I have the honor to submit for publication the following descriptive papers on Myriapoda by the late C. H. Bollman, of Bloomington, Ind. Some of these papers were left by Mr. Bollman apparently ready for the printer. These have been edited by Prof. L. M. Underwood, of Syracuse University, who has added certain notes and prepared an introductory review of the literature of the North American Myriapods. To the manuscript papers have been added all articles upon the Myriapoda previously published by Mr. Bollman, as you have yourself suggested the desirability of presenting in compact form, as a sort of memorial, the work done upon this class by one whose untimely death is so regretted. Mr. O. F. Cook, of Syracuse, N. Y., who has greatly interested himself in the subject of the Myriapods, has aided in getting the published papers together and also in selecting such short papers as were worthy of publication from the mass of manuscripts purchased, in connection with Mr. Bollman's collection, for the National Museum.

It is fitting that the Museum should publish this series of papers, because Mr. Bollman based much of his work upon Museum material and was generous enough to deposit all his types in the Museum, so that, together with the material deposited by Mr. Underwood and the work done by him for the Museum, our collection in this class is one of the most important in the country.

At the time of his death Charles Harvey Bollman was not yet 21 years of age. He was born in Monongahela City, December 24, 1868; was educated at the University of Indiana at Bloomington; graduated at this institution in the class of 1889; was appointed, immediately after graduation, as an assistant in the Fish Commission, and died at Way Cross, Ga., July 13, 1889. He was an exceptionally bright student in college; President David S. Jordan considered him, as a naturalist, one of the most brilliant and promising he had ever known, and certainly his published papers exhibit the ability and care of a well-trained man It can never cease to be a matter of regret that he did not live to carry out one of his chief ambitions, as expressed in correspondence, to monograph the Myriapoda of the United States.

Respectfully, yours,

C. V. RILEY,
Honorary Curator of Insects.

Prof. G. BROWN GOODE,
Assistant Secretary Smithsonian Institution,
In charge of National Museum.

II.

A REVIEW OF THE LITERATURE OF THE NORTH AMERICAN MYRIAPODA.

BY DR. L. M. UNDERWOOD.

The Myriapoda of the United States were first studied by Thomas Say in 1821. In a paper published in the Journal of the Philadelphia Academy of Sciences* he described eighteen species, mostly from the Southern States, which he arranged in the genera *Julus*, *Polydesmus*, *Polyxenus*, *Cermatia*, *Lithobius*, *Cryptops*, *and Geophilus*. Scattering species had already been described by the earlier European naturalists, and even in America one species had been described in 1820 by Rafinesque under the name of *Selista forceps*. Yet Say's work will stand as the first of importance, recognizing, as it does, a considerable number of species.

After Say's time no species were added to our fauna for twenty years, when Brandt (1841) published from St. Petersburg his Recueil, consisting of a reprint of a series of papers relating to the Myriapods which he had issued since 1839. Four species from our territory are here described. After Brandt came Newport, who published in 1844 a monograph of the Chilopoda, in which five species were added to our fauna and the genera *Theatops* and *Scolopocryptops* were founded, to which he referred some of Say's species. Three years later (1847) Koch published his "System der Myriapoden", in which a considerable number of American species were described. The same year appeared volume IV of "Aptères," by Baron Walckenaer and Paul Gervais, in which the latter describes two new species from the United States and includes descriptions of the species of Say, Brandt, and Newport, in all amounting to twenty-six species.

During this period two other papers appeared. In 1853 Charles Girard published in an appendix to the Report of Marcy's Exploring Expedition a description of *Scolopendra heros*, the large "centipede" of the Southwest, with plate, together with two species of *Julus* supposed to be new. Three years later Sager published brief and indefinite descriptions of three new species, giving neither distinguishing characters to his species nor the localities from which he obtained his specimens. The first four decades since Say's first publication thus found us with a known Myriapod fauna of about thirty nominal species.

*An alphabetic list of the literature relating to the American species is appended to this introduction.

In 1860 an extensive monograph of the Mexican Myriapoda was published from Geneva by Henri de Saussure, in which were described a few species from the United States and other portions of America. This was soon followed (1863) by Koch's elaborate work, "Die Myriapoden," in which he described and figured fifteen species from the United States.

Dr. H. C. Wood published a series of papers from 1861 to 1867 which to this time are the most extensive series published by a single individual, and which have formed the basis of subsequent study. His papers include a preliminary paper on *Scolopendra* (1861), followed by a general catalogue of the Chilopoda of America (1863); in 1864 appeared three papers on the various families of the Diplopoda, and the next year his "Myriapoda of North America," in which he described all the species then known to inhabit this country, comprising eighteen genera and ninety-two species. Two brief supplementary papers appeared in 1867 on sundry new species from California and Texas respectively.* A monograph of *Lithobius* by Ludwig Koch appeared in 1862, containing two species from the United States.

During the years from 1869 to 1872 E. D. Cope published, in three papers, descriptions of several cave myriapods, including the new genera *Pseudotremia*, *Andrognathus*, *Petaserpes*, and *Scoterpes*. Humbert and Saussure published "Myriapoda Nova Americana" in 1869, which contains only Mexican species, many of which are likely, however, to appear on our Arizonian borders when the Myriapod life of that region shall be studied. In 1870 Dr. Packard noted the discovery of *Pauropus* in Massachusetts, the first appearance of the order Pauropoda in America. In the same and the following year Meinert described two species from New Orleans in his "Myriapoda Musæi Hauniensis," I, II. In 1872 Oscar Harger described a number of species with the new genus *Trichopetalum*.

During the same year the sixth part of the "Mission Scientifique au Mexique" appeared, consisting of De Saussure's elaborated "Etudes sur les Myriapodes." In this work several species from the United States are described, and a very complete catalogue of all the described species from the American continent is appended. In Hayden's Geological Survey of the Territories, Annual for 1873, Dr. Packard gives some notes on the Myriapods of Colorado, and describes, without assigning names, several new forms. In 1887 he described *Polydesmus cavicola*, a cave-inhabiting species from Utah.

The travels in this country of Gustaf Eisen led to the collection of various groups of animal forms, besides the Vermes, in which he was particularly interested. The species of *Lithobius* collected by him were described by Dr. Stuxberg in 1875, amounting to seven species. Two

*As Dr. Wood nowhere mentions the work of either Saussure or Koch it is more than probable that they were unknown to him. This is still more evident from the synonyms which have resulted.

other papers, "Genera et species Lithobioidarum" and "Lithobioidæ Americæ Borealis," were published by the same author from Stockholm the same year. These papers are valuable from their full synonomy and notes on distribution. A translation of the latter paper was published in vol. VII of the Proceedings of the California Academy of Sciences. In 1877 *Brachycybe rosea*, from California, was described by Andrew Murray in his volume on "Economic Entomology." The discovery of a second species of Pauropoda in America was announced in 1878, by Dr. John A. Ryder, and in 1879, a third, forming the new genus *Eurypauropus;* the same author also published (1881) a list of the *Lysiopetalidæ*, adding a new genus and species, *Zygonopus whitei.* In 1880 Dr. Karsch, of Berlin, published three papers on the various families of Diplopoda, in which six new species from the United States are described. Kohlrausch, in 1881, published his "Gattungen und Arten der Scolopendriden," in which all the known species of this family are described. Two American species of *Scolopendra* were described, which had been briefly characterized in a preliminary paper published in 1878.

Three papers were published by Dr. Packard in 1883; the first was a description of *Polydesmus ocellatus* (afterwards referred to *Craspedosoma* by Stuxberg); the second was a revision of the Lysiopetalidæ, giving a summary of the known information to date and describing the new genus *Cryptotrichus;* the third was a morphological paper on the appendages and mouth parts of the Myriapoda.

In 1884 Dr. Latzel published a valuable monograph of the Myriapoda of Austro-Hungary in which a few notes are given on the American species of the so-called Lysiopetalidæ, most of which he referred to the Chordeumidæ; the work contains synopses of all the genera of Myriapoda and a very complete bibliography of the subject, containing 611 titles. Dr. Meinert, of Copenhagen, published in 1884 an account of the Chilopoda of the Museum of Comparative Zoölogy, describing fifteen new species from the United States; and the year following appeared the third part of his "Myriapoda Musæi Hauniensis," in which two species of *Lithobius* were added to our fauna.

In November, 1885, L. M. Underwood published a review of the principal literature on the American species, with synoptic tables of genera and a summary of the group as known to him; at that time, however, some minor papers were overlooked, so that the summary given should be somewhat increased. Twenty-seven genera with one hundred and twenty-nine species were recorded.* A subsequent paper

*The geographic distribution of the species as described up to that time is peculiar. The State having the largest number was California, with 27; then followed Pennsylvania, 25; Illinois, 16; Georgia, 13; Oregon, 12; Virginia, 10; Texas, 8; New York, 7; and Florida, 7; all others falling below 5; 15 had no described species. The report of Indiana with only two species may have incited Mr. Bollman to his study of local forms, which commenced soon after.

by the same author gave synopses of the Scolopendridæ of our region based largely on the collections of the U. S. National Museum. Mr. Jerome McNeill published (1887) two papers in the tenth volume of the Proceedings of the U. S. National Museum; in these eighteen new species were described. A third paper published in 1888 added another species, *Polydesmus butleri*, to the Indiana fauna. This brings the summary of literature to the time when Mr. Bollman first commenced his publications. It will be seen that the work on the myriapoda of the United States consists largely of fragmentary papers scattered among the scientific periodical literature of several languages. Only one work—that of Dr. H. C. Wood—made any attempts at completeness, and that had been published almost a quarter of a century. The time was ripe for some one of keen observing powers and careful judgment to collate these species already described, and collect and describe the new forms that had been or could be found. Into this work Mr. Bollman entered with enthusiasm, and his activity is shown in the numerous papers that in so short a space came from his study. In addition to the papers published in the Proceedings of the U. S. National Museum and reprinted in this volume, Mr. Bollman published seven papers: two in the *Annals of the New York Academy*, one in the *American Naturalist*, and four in *Entomologica Americana*. In these papers are included descriptions of thirty-one new species, many of which were collected in the vicinity of his home in Indiana. In addition three new genera were described.*

The anatomy, morphology, and development of the Myriapoda have remained almost untouched in America and comparatively little has been written anywhere. Its single paper by Packard on the morphology comprises about all the American literature on the subject. A few brief notes on the poisonous nature of some of the more common species have appeared from time to time. The economic relations of the Myriapoda have been only briefly considered. Besides scanty notes on the habits of certain species scattered through the papers of Wood and others mentioned above, we add a brief summary of what is included in the serial entomological reports of the various States. In his Tenth Report on the insects of New York, Fitch describes the ravages of *Polydesmus complanatus*† in cabbage, causing the so-called "club-foot." Walsh, in the *Practical Entomologist* for 1866, describes *Julus multistriatus*, which he afterwards identified as *J. ceruleocinctus* Wood,‡ as causing injury to strawberry roots. In the *American Entomologist* for 1869, he mentions two forms, a *Julus* and a *Polydesmus*, as burrowing in strawberries. In the Eleventh Illinois Report (Thomas)

*Adding to these the species described in the Proceedings of the U. S. National Museum and the extent of Mr. Bollman's work on the Myriapoda is apparent; the totals will then be 3 genera and 63 species.

†Probably *P. canadensis* Newp.

‡=*Campodes flavicornis* Koch.

D. W. Coquillett discusses the ravages of *Julus impressus* in corn, giving it the name of the "corn myriapod." Forbes, in the Thirteenth Illinois Reports, names *Cambala annulata* the "strawberry millipede," on account of its destructive habits.

Much has been written in America on the fossil Myriapoda, especially by Samuel H. Scudder. The discussion of this portion of the literature, however, is beyond the limits of the present review.

The literature above noticed chronologically, together with minor notes on structure and distribution, is appended below arranged alphabetically by authors.

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* Gives brief diagnoses of *Lithobius howei, L. pullus, L. minnesotæ, L. trilobus, L. proridens, L. cardinalis, Scolioplanes ruber* (p. 81), *Julus ellipticus, J. burkei*, and *Fontaria virginiensis brunnea* (p. 82).

† Describes *Nannolene* (gen. nov.) *burkei* (p. 225), *Parajulus castaneus* (p. 226), *P. obtectus, P. varius, Spirobolus pensacolæ* (p. 227), *S. hebes, Julus owenii* (p. 228), *Paradesmus evides, Geophilus glaber* (p. 229).

‡ Describes numerous representatives of the family, among which are the following new species: *Julus owenii* (p. 25), *Spirobolus pensacolæ* (p. 29), *S. hebes* (p. 31), *Parajulus ellipticus, P. castaneus* (p. 35), *P. obtectus, P. varius* (p. 38), *Nannolene* (n. g., p. 39), *N. burkei* (p. 40).

§ Describes *Polydesmus nitidus, Chætaspis* (n. g., p. 45), *C. albus, Scytonotus cavernarum* (p. 46).

‖ Describes *Parajulus rugosus* (p. 81), *Strongylosoma poeyi, Geophilus salemensis, G. setiger* (p. 82), *Lithobius holzingeri* (p. 83).

** Describes the following new species: *Lithobius branneri* (p. 107), *Striaria* (n. g.) *granulosa* (p. 108), *Craspedosoma carinatum* (p. 109), *Scolioplanes gracilis* (p. 110), *Lithobius cæcus* (p. 111), *L. similis* (p. 112).

†† Describes as new species: *Craspedosoma flavidum, Polydesmus minor* (p. 2), *P. pinetorum, Sphæriodesmus pudicus* (p. 3), *Linotænia branneri* (p. 4), *Geophilus okolonæ* (p. 5), *Lithobius pinguis, L. celer* (p. 7), *L. œdipes* (p. 8).

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* Notes on or description of 15 species of which the following are new: *Nannolene cubensis, Stenonia maculata, Rhacophorus magnus.*

†Mentions 32 species and describes as new *Fontaria tennesseensis.*

‡Catalogues or annotates 44 species, of which the following are described as new: *Fontaria georgiana, F. tallulah, F. rileyi, Euryurus erythropygus australis* (new subspecies), *Geophilus virginiensis, Geophilus smithi, Lithobius elattus, L. xenopus, L. underwoodi, L. rex.*

§Catalogues 64 species and describes among them the following as new: *Cambala annulata minor* (new subspecies), *Scotherpes wyandotte, Fontaria indianæ, F. butleri.*

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III.

[From *Am. Naturalist*, XXI, pp. 81, 82, Jan., 1887].

PRELIMINARY DESCRIPTIONS OF TEN NEW NORTH AMERICAN MYRIAPODS.

BY CHARLES H. BOLLMAN.

The following new species are in the museum of the Indiana University. They have been collected by different persons from various parts of the United States; those from Bloomington, Ind., being collected by myself. The types of these will be deposited in the Smithsonian Institution.

1. Lithobius howei n. sp.

Brown; antennæ 20-jointed; ocelli 25–7; prosternal teeth 6; coxal pores 5, 5, 6, 5; spines of the first pair of feet 2, 3, 2; penultimate lost; last 1, 3, 3, 1; length 15^{mm}.

Habitat.—Fort Snelling, Minn. (W. D. Howe).

2. Lithobius pullus n. sp.

Brown; antennæ 20-jointed; ocelli 12–5; prosternal teeth 4; coxal pores 3, 4, 3, 3–2, 2, 2, 2; spines of the first pair of feet 1, 3, 2–1, 2, 1; penultimate 1, 3, 3, 2–1, 3, 3, 1; last 1, 3, 3, 1–1, 3, 3, 0; claw of the female genitalia tripartite; length 9–11^{mm}.

Habitat.—Bloomington, Ind.

3. Lithobius minnesotæ n. sp.

Brown; antennæ 20-jointed; ocelli 13–6; prosternal teeth 4; coxal pores 4, 5, 5, 4; spines of the first pair of feet 1, 3, 2; penultimate 1, 3, 3, 1; last 1, 3, 2, 1; claw of the female genitalia tripartite; length, 16^{mm}.

Habitat.—Fort Snelling, Minn. (W. D. Howe).

4. Lithobius trilobus n. sp.

Brown; antennæ 20-jointed; ocelli 22–8; prosternal teeth 4; coxal pores 3, 4, 4, 3–3, 4, 4, 4; spines of the first pair of feet 1, 3, 1; penultimate 1, 3, 2, 1–1, 3, 1, 0; last 1, 3, 1, 0; claw of the female genitalia tripartite; length, 10–11^{mm}.

Habitat.—Bloomington, Ind.

5. Lithobius proridens n. sp.

Yellow-brown; antennæ 24-29 jointed; ocelli 15–6; prosternal teeth 10–12; coxal pores 4, 6, 5, 5–3, 4, 4, 3; spines of the first pair of feet 3, 3, 2–2, 3, 1; penultimate 1, 3, 3, 2–1, 3, 3, 1; last 1, 3, 3, 2–1, 3, 3, 1; claw of the female genitalia whole; length 10–12^{mm}.

Habitat.—Bloomington, Ind.

6. Lithobius cardinalis n. sp.

Brown; antennæ 20–31 jointed; ocelli 10–6; prosternal teeth 4; coxal pores 2, 4, 3, 2–2, 2, 3, 2; spines of the first pair of feet 2, 3, 2; penultimate 1, 3, 3, 1; last 1, 3, 3, 2–1, 3, 3, 1; claw of the female genitalia tripartite; length, 6–9mm.

Habitat.—Bloomington, Ind.

7. Scolioplanes ruber n. sp.

Bright red; attenuated anteriorly and posteriorly; sternum cordiform; frontal plate present; pre-basal plate concealed; ventral plates with a large, median foveola; pairs of feet in the male 67-69, female 71–73; length, 53mm.

Habitat.—Bloomington, Ind.

8. Iulus ellipticus n. sp.

Resembles *I. impressus.* Vertex with a median sulcus; eyes nearly elliptical; ocelli about 55, in 8 series; segments 46; first segment semicircular, not striate; anal spine stout, projecting beyond the valves; length, 25mm.

Habitat.—Fort Snelling, Minn. (W. D. Howe).

9. Iulus burkei n. sp.

Rather stout; brown, with a series of dark dots on each side; vertex with a median sulcus; eyes triangular; ocelli 17, indistinct, in 4 series; segments 45–47; first segment produced forward to the eyes, not striate; last segment rounded; anal valves marginate; length, 14mm.

Habitat.—Ukiah, Cal. (J. K. Burke.)

10. Fontaria virginiensis brunnea n. var.

This new variety can be easily distinguished from *virginiensis* by its color and form of last segment. Chestnut brown, lateral plates and under parts yellow, a black, median dorsal line; last segment very blunt, sparsely pilose.

[From *Proc. U. S. Nat. Mus.*, x, 1887, pp. 254-266].

NOTES ON THE NORTH AMERICAN LITHOBIIDÆ AND SCUTIGERIDÆ.

BY CHARLES H. BOLLMAN.

In examining the collection of myriapods belonging to the museum of the Indiana University, I have found a number of species new to science. On account of the confused condition of our North American myriopoda, I have deemed it best to introduce a description of the known species embraced in the same collection, as well as the description of those species supposed to be new to science.

The types of the new species have been deposited in the United States National Museum.

Family A.—LITHOBIIDÆ.

Genus I.—**LITHOBIUS** Leach.

The following key is only for the species in the present paper. The last legs of *juventus* being lost, I have not included it. In counting the spines I have also included the claw.

*Posterior angles of none of the dorsal plates produced.

a. Penultimate pair of feet armed with three spines; coxal pores in a single series, round.

b. Anal pair of feet armed with one spine.

c. Posterior coxæ unarmed.

d. Prosternal teeth 4–8; joints of the antennæ 20–23.

e. Joints of the last pair of legs not provided with or produced into knots.

f. First pair of feet armed with 0, 1, 1 spines; claw of the female genitalia bipartite ..... KOCHII, 1.

ff. Spines of the first pair of feet 1, 3, 2; claw of the female genitalia tripartite ..... MINNESOTÆ, sp. nov., 2.

fff. Spines of the first pair of feet 2, 2, 2-2, 3, 2; claw of the female genitalia whole ..... BILABIATUS, 3.

ee. Third and fourth joints produced into knots; spines of the first pair of feet 2, 3, 2; claw of the female genitalia tripartite, TUBER, sp. nov., 4.

dd. Prosternal teeth 10–12; joints of the antennæ 24–29; spines of the first pair of feet 2, 3, 1-3, 3, 2; claw of the female genitalia whole; color, yellow brown ..... PRORIDENS, sp. nov., 5.

cc. Coxæ armed with a single spine; prosternal teeth, 4; joints of the antennæ 20; spines of the first pair of feet 1, 2, 1-1, 3, 2; claw of the female genitalia tripartite ..... PULLUS, sp. nov., 6.

bb. Anal feet armed with two spines; prosternal teeth, 4; joints of the antennæ 20; ocelli, 18–25; spines of the first pair of feet 1, 3, 1; claw of the female genitalia tripartite ..... TRILOBUS, sp. nov., 7.

bbb. Anal feet armed with three spines; coxæ with an indistinct spine; prosternal teeth 4; joints of antennæ 20–31; spines of the first pair of feet 2, 3, 2; claw of the female genitalia tripartite. ..... CARDINALIS, sp. nov., 8.

** Posterior angles of 9, 11, 13 dorsal plates produced.
a. Anal pair of feet armed with one spine; penultimate with two.
b. Coxæ unarmed; coxal pores in a single series.
c. Antennæ 20-jointed; prosternal teeth 6; ocelli 25 .....HOWEI, sp. nov., 9.
cc. Antennæ more than 30-jointed; claw of the female genitalia tripartite.
d. Coxal pores round, 7, 7, 6, 5; antennæ 31-jointed; ocelli 27..AZTECUS, 10.
dd. Coxal pores transverse, 6, 6, 6, 4–9, 10, 9, 6; joints of antennæ 33–43; ocelli 23–48 .....FORFICATUS, 11.
bb. Coxæ armed with a single robust spine; coxal pores multiseriate; prosternal teeth 15–20; joints of antennæ 20, long .....XANTI, 12
aa. Anal and penultimate feet each armed with two spines; coxæ unarmed; joints of the antennæ 20; prosternal teeth 4 .....POLITUS, 13.
*** Posterior angles of the 7, 9, 11, 13 dorsal plates produced.
a. Anal feet armed with one spine; coxæ unarmed; coxal pores in a single series.
b. Penultimate pair of feet armed in the two spines; joints of antennæ 31–38; prosternal teeth 12–14; coxal pores 7, 7, 6, 5, 10, 10, 10, 9, transverse; spines of the first pair of feet 2, 2, 1, 3, 3, 2...MORDAX, 14.
bb. Penultimate pair of feet armed with three spines; joints of antennæ 26–30; prosternal teeth 8; coxal pores 4, 4, 5, 2, 4, 5, 5, 4, round; spines of the first pair of feet 1, 3, 2, 2, 3, 2 .....CLARUS, 15.
**** Posterior angles of the 6, 7, 9, 11, 13 dorsal plates produced.
a. Anal feet with a single spine; coxæ armed; coxal pores multiseriate; joints of antennæ 19–23; prosternal teeth 14–18; spines of the first pair of feet 2, 3, 1-2, 3, 2 .....MULTIDENTATUS, 17.

Subgenus *Archilithobius* Stuxberg.

1. Lithobius kochii Stuxberg.

Lithobius kochii Stuxberg, Öfver. Kongl. Vetens.-Akad. Fördhandl., 68, 1875 (*Saucelito, Cal.*)

To this species I refer a specimen from Ukiah, Cal., which has lost the antennæ and nearly all the feet. It has 11 ocelli, arranged in 5 series, prosternal teeth 4, small; coxal pores 3, 4, 4, 3, small and round; color fulvous.

2. Lithobius minnesotæ, sp. nov.

Brown, head darkest, feet and ventral laminæ not much paler; tip of antennæ and prehensorial feet rufous.

Slender, smooth; very sparsely pilose. Head subcordate, wider than long (3. 5: 3), smooth, very sparsely hirsute.

Antennæ short, joints 20, mostly long; the last long and sharp, densely hirsute.

Ocelli 13, arranged in 6 series.

Prosternal teeth 4, small and indistinct.

Coxal pores 4, 5, 5, 4, rather small, round.

Spines of the first pair of feet 1, 3, 2; penultimate 1, 3, 3, 1; last pair 1, 3, 2, 1.

Posterior pair of feet moderately long and slightly swollen.

Claw of the female genitalia moderately wide, tripartite, the middle lobe much longer; spines robust, subequal.

Length of body 16^{mm}; last pair of legs 5^{mm}.

Habitat.—Fort Snelling, Minn.

This species is described from one specimen collected by Mr. Walter D. Howe. It is related to *Lithobius pullus*, but is distinguished by its larger size, the joints of the antennæ, the coxal pores, and a few points about the claw of the female genitalia.

3. Lithobius bilabiatus Wood.

Lithobius bilabiatus Wood, Proc. Acad. Nat. Sci. Phil., 130, 1867. (*Rock Island, Ill.*)

Brown, head darkest, feet and ventral laminæ paler, the tip of antennæ rufous.

Somewhat robust, smooth, a little roughened posteriorly; sparsely hirsute, ventral laminæ sometimes almost densely hirsute posteriorly. Head large, obcordate, of nearly equal length and breadth, nearly smooth, sparsely pilose.

Antennæ short, joints 20–23, mostly long, densely hirsute.

Ocelli distinct, 11–20, arranged in 5–7 series.

Prosternal teeth 4–8, moderately large and stout.

Coxal pores 3, 4, 4, 3–4, 5, 5, 4, round; sometimes the depression is shallow and the pores indistinct.

Spines of the first pair of feet 2, 2, 2–2, 3, 2; penultimate 1, 3, 3, 1–1, 3, 3, 3; last pair 1, 3, 2, 0–1, 3, 3, 1.

Posterior feet rather short, moderately swollen.

Claw of the female genitalia large and stout, whole; spines short and strong, the inner shortest.

Length of body 12–18^{mm}; last pair of legs 5–6^{mm}.

Habitat.—Illinois (Rock Island), Indiana (Bloomington), Michigan (Ludington, N. B. Pierce).

I have examined a large number of specimens of this species from Bloomington, Ind., and one from Ludington, Mich.

4. Lithobius tuber, sp. nov.

Lithobius bilabiatus Wood, Proc. Acad. Nat. Sci. Phila., 130, 1867. (*Rock Island, Illinois, in part; not type.*)

Brown, head and antennæ darkest, tip of latter rufous, feet and ventral plates pale.

Robust, moderately smooth; dorsal plates sparsely pilose; ventral more densely pilose posteriorly.

Head large, obcordate, wider than long (3. 5: 3), moderately smooth, sparsely pilose.

Antennæ moderate, joints 20, mostly long and stout, moderately pilose.

Ocelli, 11–13, arranged in 5 or 6 series..

Prosternal teeth 4–6, small.

Coxal pores 4, 4, 5, 5–4, 5, 5, 4, large and round.

Spines of the first pair of feet, 2, 3, 2; penultimate, ♂ 1, 3, 3, 1, ♀ 1, 3, 3, 2; last pair, ♂ 1, 3, 2, 0, ♀ 1, 3 (4), 2, 0.

The last pair of legs moderate, swollen; the inner side provided with

peculiar knobs in both male and female; male, the end of the third joints produced into a short, blunt lobe, which is surmounted with 4 spines, the basal third of the fourth joint produced into a large, flat, outward curving lobe, about 3mm long, the end with a row of bristles, the end of the same joint produced into a small, sharp, outward pointing lobe; female, the end of third joint swollen, pilose, also two large spines, base of fourth joint produced into a cylindrical lobe, directed forwards, pilose, a little shorter than in the male, the end of the same joint swollen on the inner side.

Claw of the female genitalia wide, tripartite; spines stout, subequal.

Length of body 10–15mm; last pair of legs 4–5mm.

Habitat.—Bloomington, Ind., and Rock Island, Ill.

The above description was taken from a male and female from the former locality. I have also sent a male to the collection of Dr. Anton Stuxberg, of Goteborg, Sweden, under the name of *L. bilabiatus*. Dr. Wood, in his description of *Lithobius bilabiatus*, has included two species. I have restricted *bilabiatus* to the one having the ordinary type of hind legs; the other I have described as a new species—*Lithobius tuber*.

5. **Lithobius proridens**, sp. nov.

Yellow-brown; antennæ, feet, and ventral laminæ pale.

Slender, smooth, sparsely pilose; ventral laminæ more densely pilose posteriorly.

Head obcordate, of about equal length and breadth (3: 2. 5), smooth, sparsely pilose.

Antennæ moderate, joints 24–29, short; rather densely pilose.

Ocelli sometimes indistinct and irregular, 8–15, arranged in 4–6 series.

Prosternal teeth 10–12, small, not crowded together.

Coxal pores 3, 4, 4, 3–4, 6, 5, 5 large and round.

Spines of the first pair of feet 2, 3, 1–3, 3, 2; penultimate 1, 3, 3, 1–1, 3, 3, 2; last pair 1, 3, 3, 1–1, 3, 3, 2.

Posterior pair of feet long, not swollen.

Claw of the female genitalia long and slender, whole; spines moderate, subequal.

Length of body 10–12mm; last pair of legs 4–5mm.

Habitat.—Bloomington, Ind.

This species is common under leaves, etc.

The following is the description of a specimen 5mm long.

Antennæ short, joints 21. Prosternal teeth 10.

Ocelli distinct, 1, 2, 1. Coxal pores, 1, 1, 1, 1.

Spines of the first pair of legs 2, 3, 1; penultimate 1, 3, 3, 1; last pair 1, 3, 3, 1.

6. **Lithobius pullus**, sp. nov.

Brown; head darkest, feet and ventral laminæ pale; tip of antennæ *and prehensorial feet* chestnut.

Rather robust, smooth; sparsely hirsute, more densely beneath.

Head obcordate, longer than wide (7:6); moderately smooth; sparsely pilose.

Antennæ short, joints 20, not as short as in the preceding; the last joint long and sharp.

Ocelli moderate, 10–12, in 5 series.

Prosternal teeth 4, small and indistinct.

Coxal pores 2, 2, 2, 2–3, 4, 3, 3, moderately large and round.

Spines of the first pair of feet 1, 2, 1–1, 3, 2; penultimate 1, 3, 3, 1–1, 3, 3, 2; last pair 1, 3, 3, 0–1, 3, 3, 1.

Posterior pair of feet rather short, not swollen.

Claw of the female genitalia tripartite, the middle lobe by far longer than the others, which are small and indistinct; spines short and robust, the inner shortest.

Length of body 9–11^{mm}; last pair of legs 3^{mm}.

Habitat.—Bloomington, Ind.

I have over a dozen specimens of this species.

7. Lithobius trilobus, sp. nov.

Brown; head and the last 3–4 segments darkest; feet and ventral laminæ gray-brown; tip of antennæ and prehensorial feet chestnut.

Rather slender, but wide and thin, moderately smooth; sparsely pilose, the ventral laminæ more densely.

Head obcordate, a little longer than wide (6. 5:6. 2); nearly smooth; sparsely pilose.

Antennæ short, joints 20, mostly short, the last moderately long and blunt; densely pilose.

Ocelli 18–25, arranged in 7–8 series.

Prosternal teeth 4, small and indistinct.

Coxal pores 3, 4, 4, 3–4, 5, 5, 4, large and round.

First pair of feet armed with 1, 3, 1 spines; penultimate 1, 3, 1, 0–1, 3, 2, 1; last pair 1, 3, 1, 0.

Posterior pair of feet moderately long, not swollen; in the male the fifth joint is produced into a short lobe on the inner side.

Claw of the female genitalia wide, tripartite, the middle lobe not much longer than the others; spines rather short and stout.

Length of body 10–12^{mm}; last pair of legs 3. 5^{mm}.

Habitat.—Bloomington, Ind.

This species is described from a number of specimens.

It is easily distinguished from the preceding by the claw of the female genitalia and by the greater number of ocelli.

8. Lithobius cardinalis, sp. nov.

Brown; head, tip of antennæ, and last pair of legs chestnut; ventral laminæ and feet light.

Slender, smooth; sparsely pilose.

Head large, subcircular, wider than long (7:6); sparsely pilose.

Antennæ short, joints 20–31, rather short and thick; densely pilose.

Ocelli distinct, 9–10, in 4–6 series.

Prosternal teeth 4, small and indistinct.

Coxal pores 2, 2, 3, 2–2, 4, 3, 2, round.

Spines of the first pair of feet, 2, 3, 2; penultimate 1, 3, 3, 1; last pair 1, 3, 3, 1–1, 3, 3, 2.

Posterior pair of feet moderate, not swollen. Claw of the female genitalia wide, tripartite, the middle lobe not much longer; spines short and robust, the inner shortest.

Length of body 6–9^{mm}; last pair of legs 2–2.5^{mm}.

Habitat.—Bloomington, Ind.

This species is common; I have taken it mostly under boards laid on a heavy growth of grass in the spring.

Subgenus *Lithobius* Stuxberg.

9. Lithobius howei, sp. nov.

Brown; head chestnut, antennæ very dark, feet and ventral laminæ pale.

Robust, not smooth, more so posteriorly; sparsely pilose.

Head large, subquadrate, a little wider than long; sparsely pilose.

Antennæ short, joints 20, mostly long; densely pilose.

Ocelli distinct, 25, arranged in 7, very oblique series.

Prosternal teeth 6, small.

Coxal pores 5, 5, 6, 5, large and oval.

Spines of the first pair of feet 2, 3, 2; penultimate lost; last pair 1, 3, 3, 1.

Last pair of feet rather long.

Length of body 15^{mm}; last pair of legs 7^{mm}.

Habitat.—Fort Snelling, Minn. (Walter D. Howe.)

This species is described from one male in a rather bad condition, collected by my friend and fellow-student Mr. Walter D. Howe, after whom the species is named.

10. Lithobius ? aztecus Humbert & Saussure.

Lithobius aztecus Humbert & Saussure, Rev. & Mag. Zool., 2^{e} ser., XXI, 156, 1869.

Brown; scuta margined posteriorly with dark; head and antennæ dark; prehensorial feet and tip of antennæ rufous; feet and ventral laminæ very pale.

Robust, not smooth, more so posteriorly; sparsely pilose.

Head large, subquadrate, a little wider than long (4.5: 4); nearly smooth, sparsely punctate; a few hairs scattered over the surface.

Antennæ moderate, joints 31, rather densely pilose.

Ocelli 27, arranged in 8 series, rather crowded together.

Prosternal teeth 12, the inner very small, the rest of an even size.

Coxal pores 7, 7, 6, 5, round and small.

Spines of the first pair of feet, 2, 3, 2; penultimate 1, 3, 3, 2; last pair 1, 3, 3, 2.

Last pair of feet moderately long and swollen.

Claw of the female genitalia not wide, indistinct tripartite, the middle lobe much longer; spines slender, the inner shortest.

Length of body 15^{mm}; last pair of legs 9^{mm}.

Habitat.—Ukiah, Cal. (J. H. Burke), and Mexico.

This species is described from one female, from the former locality, which has the antennæ and posterior legs broken off. Having only a short description of *aztecus*, I do not feel sure of my identification, although it agrees with it as far as it goes.

11. Lithobius forficatus Linnæus.

Scolopendra forficata Linnæus, Syst. Nat. Ed. x, I, 638, 1758.

Lithobius forficatus Leach, Edinb. Encycl., vii, 408, 1815.

Brown, of varying shades; feet and ventral laminæ paler; tip of antennæ rufous.

Robust, not smooth; a little hirsute, especially posteriorly, and along the edges of the dorsal laminæ.

Head large, subquadrate, much wider than long (8: 5. 5), rough, punctate, especially the frontal plate.

Antennæ long, joints 33–43, mostly short, densely hirsute.

Ocelli distinct or not, 23–48, arranged in 6–8 series.

Prosternal teeth moderate, 8–12.

Coxal pores 6, 6, 6, 4–9, 10, 9, 6, transverse or round in younger specimens.

Spines of the first pair of feet, 2, 3, 2; penultimate, 1, 3, 3, 2; last pair 1, 3, 3, 2.

Posterior feet long, not much inflated.

Claw of the female genitalia trilobed, the middle lobe much longer; spines short, robust, the inner shortest.

Length of body 18–28^{mm}; last pair of feet 10^{mm}.

Habitat.—Eastern United States.

I have examined about a dozen specimens of this species from Ludington, Mich., and one from Bloomington, Ind. One female has the claw of the genitalia four-lobed—having two divisions on the inner side of the middle lobe.

The following is a description of a young specimen:

Antennæ 32-jointed.

Ocelli 14, in 6 series.

Prosternal teeth 6–10.

Coxal pores 3, 3, 3, 3, round.

Spines of the first pair of feet, 2, 3, 2; penultimate 1, 3, 3, 1; last pair, 1, 3, 2, 0.

Length of body 11^{mm}; last pair of feet 4^{mm}.

12. Lithobius xanti Wood.

Lithobius xanti Wood, Journ., Acad. Nat. Sci., Phila., 15, 1863.

Fulvous, feet, antennæ and ventral plates pale, head dark.

Robust, not smooth; sparsely pilose above, the ventral plate densely pilose posteriorly.

Head moderate, obcordate, not much wider than long (5.3:5); smooth, sparsely pilose.

Antennæ long, joints 20, all long.

Ocelli 12–15, arranged in 6 or 7 series.

Prosternal teeth 15–20, small, not coadnate on the inner side.

Coxal pores numerous, arranged in 3–5 series.

Spines of the first pair of feet 2, 3, 1; penultimate (1), 1, 3, 3, 2; last pair (1), 1, 3, 2, 0, or (1), 1, 3, 2, 1.

Last pair of feet long, slender, not swollen.

Claw of the female genitalia long, wide, tripartite, the middle lobe long, the inner very small; spines, 3 on each side, long, slender, and wavy.

Length of body 20–25^{mm}; last pair of legs 9–11^{mm}.

Habitat.—California and Oregon.

I have examined a number of specimens of this species from Ukiah, Cal., collected by Mr. J. H. Burke.

13. Lithobius politus McNeill.

Lithobius politus McNeill (MSS.).

Brown; head, antennæ and edges of dorsal plates dark; feet and ventral plates paler.

Robust, smooth pilose.

Head moderate, obcordate, of about equal length and breadth; sparsely pilose.

Antennæ short, joints 20, mostly long.

Ocelli 15–18, arranged in 6 or 7 series.

Prosternal teeth 4, small.

Coxal pores 3, 4, 4, 3–5, 6, 6, 6, round.

Spines of the first pair of feet 1, 3, 2; penultimate 1, 3, 3, 1; last pair 1, 3, 2, 1.

Last pair of feet moderate, scarcely swollen.

Claw of female genitalia short, wide, tripartite, the middle lobe not much longer; spines short and thick, subequal, the outer sometimes indistinct, notched on the inner side.

Length of body 8–11^{mm}; last pair of legs 3–4^{mm}.

Habitat.—Dublin and Bloomington, Ind., and Ludington, Mich.

I have examined the types of this species from Dublin, Ind., besides a number of specimens from Ludington, Mich., and one female from Bloomington, Ind. The one from the latter place is larger; the coxal pores are also more numerous and of a larger size.

Subgenus *Neolithobius* Stuxberg.

14. Lithobius mordax Koch.

Lithobius mordax Koch., Die Myriapodengattung Lithobius, 34, 1862.

Brown, ventral laminæ, feet and tip of antennæ light; prehensorial feet bright chestnut.

Robust, not smooth, more so posteriorly.

Head subcordate, slightly longer than wide; punctate.

Antennæ long, joints 31–38, mostly small; densely pilose.

Ocelli numerous, 34–50, in 7–10 series.

Prosternal teeth 12–14, stout, conic, not crowded much together.

Coxal pores 7, 7, 6, 5–10, 10, 10, 9, large, nearly all transverse.

First pair of feet armed with 2, 2, 1–3, 3, 2 spines; penultimate 1, 3, 3, 2; last pair 1, 3, 3, 1, or 1, 3, 3, 2.

Posterior feet rather long, scarcely inflated.

Claw of the female genitalia large, trilobed, the middle one by far the largest; spines rather long and slender, the inner shortest.

Length of body 20–26^{mm}; last pair of legs 10–11^{mm}.

Habitat.—Indiana, Kansas, Louisiana, Mississippi, and Florida.

I have examined specimens of this species from Bloomington, Ind., and Pensacola, Fla. Those from the latter locality have the coxal pores more numerous, the spines of the first pair of feet less, and a lighter coloration. One specimen 18^{mm} long, from the same place, has the ocelli 25 in number.

15. Lithobius clarus McNeill.

Lithobius clarus McNeill (MSS.).

Yellowish-brown; edges of scuta darker, antennæ dark, tip rufous; ventral laminæ and feet somewhat paler.

Rather slender, scarcely robust, smooth.

Head obcordate, length and breadth equal; a little rough.

Antennæ moderately long, joints 26–30, becoming shorter towards the end, not densely pilose.

Ocelli moderate, 20–27, in 5–7 series.

Prosternal teeth 8, short, evenly separated.

Coxal pores few, 4, 4, 5, 3–4, 5, 5, 4, round.

Spines of first pair of feet 1, 3, 2–2, 3, 2; penultimate 1, 3, 3, 2; last pair 1, 3, 3, 1–1, 3, 3, 2.

Last pair of feet long, not inflated.

Claw of female genitalia broad, trilobed, the middle lobe about 1½ as long again as the others; spines moderately long and slender, the inner shortest.

Length of body 15^{mm}; last pair of feet 6^{mm}.

Habitat.—Pensacola, Fla.

The above description is taken from part of the type specimens. The following is a description of a young specimen:

Yellow; slender. Joints of antennæ 28.

Ocelli few, 13, arranged in 5 series.

Prosternal teeth 8.

Coxal pores 4, 4, 4, 3.

Spines of first pair of feet 1, 2, 1; penultimate 1, 3, 3, 2; last pair 1, 3, 3, 1.

Length of body 11mm; last pair of feet 4. 5mm.

16. Lithobius juventus, sp. nov.

Brown; head and antennæ dark, tip of latter fulvous, feet and ventral plates pale.

Slender, not smooth; sparsely pilose.

Head large, subcircular, of nearly equal length and breadth, nearly smooth; sparsely pilose.

Antennæ moderately long, joints 31, short; rather densely pilose.

Ocelli 10, arranged in 4 series.

Prosternal teeth 4, small.

Coxal pores 4, 4, 4, 3, round.

Spines of the first pair of feet (?) 1, 3, 2; penultimate, 1, 3, 3, 1; last 1, 3, 3, 1.

Last pair of feet moderate, not swollen.

Claw of the female genitalia wide, short, tripartite, middle lobe longest; spines long and slender, subequal.

Length of body 9mm; last pair of legs 3.5mm.

Habitat.—Bloomington, Ind.

At first this species might be taken for the young of *mordax*. I have no young specimens of the latter on hand, but judging from Dr. Meinert's description of a specimen 15.5mm long, it can easily be separated by the number of prosternal teeth (4 instead of 10), by the spines of the first pair of legs (1, 3, 2 instead of 2, 1, 1) and by the number of ocelli.

Subgenus *Eulithobius* Stuxberg.

17. Lithobius multidentatus Newport.

Lithobius multidentatus Newport, Trans. Linn. Soc., xix, 365, 1845.

Brown; varying from a deep mahogany to rather a light yellowish-brown; ventral laminæ and feet paler; tip of antennæ, mouth parts, and the last few joints of the hind legs rufous.

Rather strongly or moderately robust; not smooth, more so posteriorly.

Head subobcordate, wider than long (6:5), somewhat rough.

Antennæ short, joints 19–23, mostly long.

Ocelli numerous, 27–35, arranged in 7–8 series.

Prosternal teeth 14–18, rather short, stout, conic, not crowded together.

Coxal pores numerous, large and small, arranged in 3–5 series.

First pair of feet armed with 2, 3, 1–2, 3, 2 spines; penultimate 1, 3, 3, 1–1, 3, 3, 2; last pair 1, 3, 2, 1–1, 3, 3, 2.

Last pair of feet long, not swollen.

Claw of the female genitalia wide, tripartite; spines moderately long and stout, subequal, point of the inner sometimes curved inwards.

Length of body 25mm; posterior legs 10mm.

Habitat.—Eastern United States.

I have examined numerous specimens of this species from Bloomington, Ind., and Ludington, Mich.

Specimens 12mm long differ from the adult as follows:

Violet-brown; head bright chestnut; antennæ and posterior legs lighter.

Antennæ moderate, joints 20, moderately long.

Ocelli 16–17, arranged in 6 series.

Coxal pores arranged in 2 or 3 series.

Length of last pair of legs 5mm.

Specimens 10mm long differ from the above in having 13 ocelli, arranged in 6 series; coxal pores in 1 or 2 series, and the spines of the first pair of feet 2, 3, 1; length of last pair of legs 3mm, while those 5mm long have the ocelli 8, in 5 series; coxal pores 2, 2, 2, 2, in one series; spines of the first pair of feet 1, 2, 1; length of last pair of legs 2mm.

Family B.—SCUTIGERIDÆ Gervais.

Genus II.—SCUTIGERA Lamarck.

18. Scutigera forceps (Rafinesque).

Selista forceps Rafinesque, Annals of Nature, 7, 1820.
Scutigera forceps Meinert, Proc. Amer. Philos. Soc., Phila., 171, 1885.

Light brown, dorsal plates with three black stripes, the outer more or less broken, a greenish spot on the posterior border of each plate on each side of the median line; antennæ and tarsi brown, patella and tibia with two bluish bands, those of the last pair of legs dark, almost violet.

Robust, dorsal plates with obscure tubercles, spines numerous, arranged in almost regular series.

Cephalic plate large posteriorly, a moderate sulcus, not much impressed, margins not strongly elevated, moderately smooth, wider than long (6:5).

Antennæ rather slender, exceeding the length of body.

Dorsal plates moderately marginate, outer margin very sparsely spinulose, posterior margin strongly rounded, deeply excised in the middle, spines more numerous than on the outer margin.

Last dorsal plate narrow, with two indistinct transverse sulcations, sides rounded, not converging much, posterior margin obscurely excised.

All the stomata, except the first, of nearly equal length, first about 4 times in length of the dorsal plate.

Feet moderately carinated, spines rather numerous.

Last pair of feet a little more than twice as long as body, slender; tibia somewhat clavate, armed with two long, unequal spines.

Forceps of the female moderately short, sparsely pilose, on the inner side of the first joint a brush-like bunch of hair; the first joint longer than last (4:3).

Length of body 20–25^{mm}; last pair of legs 40–55^{mm}.

Habitat.—Eastern United States.

I have examined specimens of this species from Bloomington and New Harmony, Ind. *Scutigera linceci*, the only other species recorded from the United States, is much smaller and differs in color.

NORTH AMERICAN SPECIES OF LITHOBIIDÆ AND SCUTIGERIDÆ.

The following is a list of the North and Central American species of *Lithobiidæ* and *Scutigeridæ* known to date.

I have used the following letters for the different Zoo-Geographical regions as given in the Report U. S. Entomol. Comm., No. 3:

B = Boreal (Canadian) Province.
E = Eastern (Atlantic) Province (n = north; s = south).
W = West India or Antillean.
C = Central Province.
P = Western (Pacific) Province.
C A = Central America.

Family A.—LITHOBIIDÆ.

Genus I.—HENICOPS Newport.

1. *Henicops fulvicornis* (Meinert). E n.

Genus II.—LITHOBIUS Leach.

Subgenus *Archilithobius* Stuxberg.

2. *Lithobius cardinalis* Bollman. E n.
3. *Lithobius pullus* Bollman. E n.
4. *Lithobius trilobus* Bollman. E n.
5. *Lithobius bilabiatus* Wood. E n
6. *Lithobius tuber* Bollman. E n.
7. *Lithobius minnesotæ* Bollman. E n.
8. *Lithobius paradoxus* Stuxberg. P.
9. *Lithobius obesus* Stuxberg. P.
10. *Lithobius kochii* Stuxberg. P.
11. *Lithobius jowensis* Meinert. E n.
12. *Lithobius exiguus* Meinert. E n.
13. *Lithobius lundii* Meinert. E n.
14. *Lithobius toltecus* Humb. & Sauss. C A.
15. *Lithobius pusio* Stuxberg. P.
16. *Lithobius proridens* Bollman. E n.
17. *Lithobius monticola* Stuxberg. P.
18. *Lithobius bipunctatus* (Wood). P.

Subgenus *Hemilithobius* Stuxberg.

19. *Lithobius eucnemis* Stuxberg. E.
20. *Lithobius cantabrigensis* Meinert. E n.

Subgenus *Pseudolithobius* Stuxberg.

21. *Lithobius megaloporus* Stuxberg. P.

Subgenus *Lithobius* Stuxberg.

22. *Lithobius mexicanus* Perbosc. C A.
23. *Lithobius pinetorum* Harger. P.
24. *Lithobius howei* Bollman. E n.
25. *Lithobius paucidens* Wood. P.
26. *Lithobius mysticus* Humb. & Sauss. C A.
27. *Lithobius aztecus* Humb. & Sauss. C A, P.
28. *Lithobius forficatus* (Linnæus). B, E n, E s.
29. *Lithobius aureus* McNeill. E s.
30. *Lithobius politus* McNeill. E n.
31. *Lithobius saussurei* Stuxberg. C A.
32. *Lithobius planus* Newport. (?) B.
33. *Lithobius xanti* (Wood). P.

Subgenus *Neolithobius* Stuxberg.

34. *Lithobius transmarinus* Koch. E s.
35. *Lithobius juventus* Bollman. E n.
36. *Lithobius latzeli* Meinert. E n.
37. *Lithobius mordax* Koch. E n, E s.
38. *Lithobius vorax* Meinert. E s.
39. *Lithobius clarus* McNeill. E s.

Subgenus *Eulithobius* Stuxberg.

40. *Lithobius multidentatus* Newport. E n.

Family B.—SCUTIGERIDÆ Gervais.

Genus III.—SCUTIGERA Lamarck.

41. *Scutigera forceps* (Rafinesque). E n, E s.
42. *Scutigera mexicana* (Humb. & Sauss). C A.
43. *Scutigera linceci* (Wood). E s.
44. *Scutigera elegans* Gervais. W.
45. *Scutigera guildingii* (Newport). W.
46. *Scutigera occidentalis* Meinert. C A.

INDIANA UNIVERSITY,
Entomological Laboratory, January 7, 1887.

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DESCRIPTIONS OF FOURTEEN NEW SPECIES OF NORTH AMERICAN MYRIAPODS.

BY CHARLES H. BOLLMAN.

The present paper contains descriptions of fourteen species of myriapods which I believe to be new.

The types of all have been presented to the U. S. National Museum.

I take pleasure in acknowledging my indebtedness for specimens to Prof. George F. Atkinson, of the University of South Carolina; to Dr. Richard D. Owen, of New Harmony, Ind.; to Mr. Charles B. Branner, of Mossy Creek, Tenn.; to Mr. and Mrs. Carl H. Eigenmann, of San Diego, Cal.; to Mr. Charles L. Edwards, of Johns Hopkins University; to Mr. James H. Burke, of Ukiah, Cal., and to Mr. Frederick C. Test, of Westfield, Ind.

1. Parajulus ectenes, sp. nov.

Diagnosis.—Allied to *Parajulus pennsylvanicus* (Brandt), but the form of body much more slender, the repugnatorial pore not touching transverse suture, which is straight, and the male genitalia entirely different.

Type.—U. S. Nat. Museum.

Habitat.—Chapel Hill, Orange County, N. C.

Description of type.—Very dark brown, almost black, light spots more or less confluent and indistinct, joints of antennæ tipped with white; legs brown, slender; segments pilose and sulcate, as in *pennsylvanicus*. Vertex not sulcate, setigerous foveolæ present. Antennæ scarcely subclavate, longer than width of body. Ocelli distinct, ♂ 70-9, ♀ 60–8, arranged in a subtrapezoidal patch. Last segment not passing beyond anal valves, which are pilose and not marginate; anal scale obtuse-angled.

Number of segments, ♂ and ♀ 67.

Pairs of legs of female, 120.

Length of body: ♂ 46^{mm}, width 1.6^{mm}, antennæ 2.7^{mm}; ♀ length 54^{mm}, width 1.8^{mm}, antennæ 1.9^{mm}.

I have a single pair of this species, collected by Prof. George F. Atkinson. In the same collection there is a young *Parajulus* that probably belongs to this species. This species differs from any other by the slender body and peculiar form of the male genitalia, which I have not described here, but will do so in a paper relating to the genus. It ay be worthy of remark that at present I consider the *Julus pilosistis* of Wood as identical with *P. pennsylvanicus* (Brandt). His de-

scriptions seem to apply more to the younger stages of the latter. Concerning the status of *Julus montanus* Cope, I have regarded it as identical with *P. pennsylvanicus*, but it may represent a geographical form, as those from farther south have more segments and attain a larger size.

2. Parajulus zonatus, sp. nov.

Diagnosis.—Related to *Parajulus furcifer* (Harger), but the anal segment produced into a strong spine, which passes considerably beyond anal valves; segments with short, deep sulcations; color dark brown, posterior border of segments pale.

Type.—U. S. Nat. Museum.

Habitat.—Chehalis, Lewis County, Wash. Terr.

Description of type.—Brown, posterior border of segment pale, usual yellow lines and spots absent, legs dark. Robust, segments with numerous short sulcations, not pilose. Vertex rough, a distinct median sulcus, setigerous foveolæ present. Antennæ equaling width of body. Ocelli 46–7 to 56–8, arranged in a triangular patch. Segments, 52 to 53. Last segment produced into a large, straight, robust spine, passing beyond anal valves; anal valves slightly marginate, sparsely pilose; anal scale large, not passing beyond anal valves, pilose. Repugnatorial pore large, more deeply impressed than in *furcifer*, placed near transverse suture, which is nearly straight.

Pairs of legs, 93 to 95, moderately long. Length of body, 25 to 40^{mm}; width, 2 to 2.5^{mm}.

This species differs most strikingly from *P. furcifer* by having the last segment produced considerably beyond anal valves, and also by the plain color. In *P. furcifer* the last segment does not pass beyond the anal valves, and the yellow lines and spots, which are absent in *zonatus* and generally present in other species, are very bright; in fact, much more than in any other species.

The male genitalia, of which I have said nothing, differ very remarkably from that of *P. furcifer* or *P. oregonensis*.

I have examined two males of this species. They were collected by Mr. George Gregg, of Chehalis, Wash. Terr.

3. Craspedosoma atrolineatum, sp. nov.

Diagnosis.—Light brown, lateral carinæ and a median dorsal line dark. Male: Femur of fourth pair of legs produced at the middle into a knob-like process armed with a few rather large tubercles; femur of ninth pair with a cylindrical, tapering basal lobe, which is slightly tuberculate.

Type.—U. S. Nat. Museum.

Habitat.—Glacier, British Columbia.

Description of type.—Light brown, lateral carinæ and a median dorsal line black; legs pale. Robust, attenuated anteriorly and posteriorly, back not flattened. Ocelli very distinct, arranged in a subtriangular

patch, 20–4 to 23–5. Dorsal plates finely reticulated. Antennæ and legs long.

Male: 3, 4, 5, 6, 7 pairs of legs crassate, rest slender; about the first fifteen pairs, excepting the first two, with the tarsal joint armed on the under side with an elongate patch of short tubercles extending from the middle to claw, coxa not tuberculate; femur of fourth pair of legs produced into a knob-like appendage on the under side near the middle and armed with three or four moderately large sharp tubercles; femur of ninth pair with an inward projecting, cylindrical, tapering, basal lobe, which is indistinctly tuberculate on the upper side.

Length of body: ♂ 16 to 18.5mm, width 1.2 to 1.5mm; ♀ length 13 to 16mm, width .9 to 1.2mm, antennæ 2mm.

This new species is more related to the cave form *Craspedosoma hollmani*, the male of which has the same peculiar knobs, but the tuberculation is different. From Harger's description of *C. glomeratum* this species seems to differ in having a dark median dorsal line, besides being of a larger size.

I have examined over a dozen specimens collected by Mr. Carl H. Eigenmann.

4. Paradesmus dasys, sp. nov.

Diagnosis.—Very similar to *Paradesmus gracilis* (Koch), but the tibia and tarsi of male tuberculate beneath; vertex pilose on each side of sulcus, first and penultimate segments with two rows of setæ, rest with one; copulation foot resembling that of *gracilis*.

Type.—U. S. Nat. Museum.

Habitat.—Baltimore, Md.

This species is very closely related to *Paradesmus gracilis*, as shown by the character of male genitalia, but is at once recognized by the characters given in the diagnosis. The following differences were also observed, which, except the characters of male genitalia, are not of much importance:

Dorsal plates somewhat wrinkled; repugnatorial pore (as compared with Saussure's figure of *P. coarctatus* = *P. gracilis*) not placed so far back nor the lateral carinæ so swollen; the end of the sheath inclosing the flagellum finely serrate as well as its branch; the other lobe widely three or four toothed; length of body, ♂ 15.5 to 20mm, ♀ 17 to 22.5mm.

I have examined three males and a number of females collected by Mr. Charles L. Edwards, of Johns Hopkins University.

5. Polydesmus testi, sp. nov.

Diagnosis.—Tuberculation as in *P. moniliaris* Koch,* but the lateral carinæ not finely serrated; tubercles setæ-tipped; male genitalia very similar to *Polydesmus inconstans* Latzel.†

**Polydesmus moniliaris* Koch, Syst. Myr., 135, 1847 (Pennsylvania) = *Polydesmus serratus* Wood, Trans. Amer. Philos. Soc., 215, 1865 (Pennsylvania).

†*Polydesmus inconstans* Latzel, Les Myr. Normandie, 21, 1883.

Type.—U. S. Nat. Museum.

Habitat.—Indianapolis, Ind.

Description of type.—Brown, legs and under parts paler. Slender, scarcely attenuated anteriorly, moderately shining. First dorsal plate transversely suboval, tubercles 10–6–8, setæ tipped; lateral margin one-toothed. Tuberculation of anterior segments rather indistinct, 4–4–6; posteriorly the first row is more obliterated, the second is usually composed of six tubercles, and those of the last row are acute and project beyond posterior border of segment; lateral margins three or four toothed. Legs long.

Male: Legs strongly crassate, last four joints tuberculate beneath; coxa of second pair much produced and the end of lobe pitted; femur not much swollen above; genitalia very similar to *P. inconstans* Latzel.

Length of ♂ 11.6^{mm}, width of first segment 1.1^{mm}, width of tenth, 1.3^{mm}; ♀ length 8.5^{mm}, width of first segment, 8^{mm}, width of tenth segment 1^{mm}.

This species is very closely related to the European *Polydesmus inconstans* Latzel, as is shown by the tuberculation and the form of male copulation foot, while it only resembles *P. moniliaris* Koch in tuberculation.

I have examined a male and a female, collected by Mr. Frederick C. Test, my friend and fellow-student, for whom the species is named.

6. Polydesmus branneri, sp. nov.

?? Polydesmus pennsylvanicus Koch, Syst. d. Myr., 133, 1847 (Pennsylvania); Koch, Die Myriopoden, ii, 18, pl. 69, fig. 142, 1863.

Diagnosis.—Very similar to *Polydesmus serratus* Say,* but body more depressed and attenuate anteriorly; antennæ and legs more slender and in the male less crassate.

Type.—U. S. Nat. Museum.

Habitat.—Mossy Creek, Jefferson County, Tenn.

As the characters of *P. serratus* vary exceedingly in respect to size and form, I have had considerable trouble in using characters exact enough to distinguish *P. branneri* from the various forms of *P. serratus*. The most important differences by which *P. branneri* is separated from *P. serratus* are those of the male genitalia; but as it is almost impossible to give a good definition of these characters, I have thought it best to say nothing now, but wait until I can have good figures made.

Concerning the male genitalia of *P. serratus*, I may say that in all the specimens I have examined from Minnesota, Illinois, Indiana, Pennsylvania, and North Carolina, I find that the characters are essentially similar, the only important variation being in the number of plate-like spines. I have thought that *P. branneri* may be identical with

**Polydesmus serratus* Say, Journ. Phila. Acad. Nat. Sci., 106, 1820 = *P. canadensis* Newport, Ann. and Mag. Nat. Hist., 205, 1844 (Hudson's Bay) = *P. glaucescens* Koch, Syst. d. Myr., 133, 1847 (North America). *? P. pennsylvanicus* Koch, Syst. d. Myr., 133, 1847 (Pennsylvania).

Koch's *pennsylvanicus*, concerning which he says: "*Der Körper im Verhältniss zur Länge ziemlich breit, * * * die Seitenkanten der Seitenlappen glattrandig.*"

This is all of his description that is of any value; the first will fit both species, while the last will only suit *P. serratus*, for the serratures are present in *P. branneri*, although they are small.

I have never seen a specimen of *P. serratus* with the serratures obliterated, but concerning this Dr. Wood says:* "The serratures in the lateral margins of the side plates are very minute and frequently obsolete;" and Professor Saussure:† "*Ils le sont en effet, mais si finement qu'on ne distingue les dentelures qu'au moyen du microscope ou d'une forte loupe.*" Judging from these quotations, I am inclined to believe that *P. pennsylvanicus* is identical with *serratus*, or, at any rate, a species distinct from my *branneri*.

I have examined a number of specimens collected by Mr. Charles B. Branner, but most of them are broken. All the females in the collection are much smaller than the male, as the following measurements will show:

Measurements of Polydesmus branneri.

Sex.	Length of body.	Breadth of first segment.	Breadth of tenth segment.	Length of antennæ.
	mm.	*mm.*	*mm.*	*mm.*
♂	25.3	2.6	3.5	4.6
♂	24.8	2.9	3.	4.3
♀	18.6	2.6	2.9	3.2

7. Fontaria evides, sp. nov.

Diagnosis.—Coxa of second pair of legs produced into a blunt, cylindrical lobe; only lateral carinæ distinctly red.

Type.—U. S. Nat. Museum.

Habitat.—Mossy Creek, Jefferson County, Tenn.

Description of type.—Black, lateral carinæ, a spot on anterior border of first and on posterior border of penultimate segments red, antennæ brown, legs yellow, tarsal joints reddish, an indistinct row of reddish brown spots above lateral carinæ. Body depressed, anterior segments of male not attenuated, those of female very noticeable; first four segments moderately smooth, rest rough except along middle of back. Vertex, sulcus shallow, setigerous foveolæ present. Antennæ of male somewhat clavate, female filiform. First segment as in *Fontaria virginiensis*. Lateral carinæ large and moderately produced. Repugnatorial pore rather large and placed on the upper edge of posterior third of carinæ. Ventral plate and coxa unarmed. Male: Coxa of first pair of feet produced into a blunt, cylindrical lobe, coxa of fourth pair moderately; femur of anterior legs swollen above; genitalia loosely coiled,

*Trans. Amer. Philos. Soc., 216, 1865. †Essai d. Faun., Myr. Mex., 68, 1860.

expanded at middle third and slightly lobed; basal spine cylindrical. Length of body: ♂ 33mm, height 5mm, width of first segment 7.8mm, width of tenth 9.5mm, antennæ 7.7mm; ♀, length of body 36.8mm, height 6.3mm, width of first segment 8mm, width of tenth 10mm, antennæ 7.1mm.

This species is closely allied to the next, but differs very much in color and in the characters of the anterior segments, and male genitalia. I have seen a male and a female which were collected by Mr. Charles B. Branner. The female has a browner pattern of coloration and the red is not so vivid as in the male.

8. Fontaria rubromarginata, sp. nov.

Diagnosis.—Very similar to *Fontaria evides*, but the first three segments of male attenuated; vertex, sulcus deeper; femur more swollen; anterior border of first and posterior of other segments red.

Type.—U. S. Nat. Museum.

Habitat.—Balsam, Jackson County, N. C.

This species is closely related to the preceding. It differs, however, much in color and in the character of male genitalia. As compared with the male of *F. evides*, the following points may be worthy of note:

Browner, legs yellow; lateral plates not so sharp; legs of male more crassate; distal fourth of genitalia very much expanded near the end; basal spine stout, *bifid;* two lateral lobes, the first trifid, the other bifid; length of body, 38mm; height, 5mm; width of segment, 6.3mm; width of tenth, 10mm; antennæ, 8.3mm.

The characters of ventral plates and coxæ are the same as in *F. evides.*

These notes are based upon a male collected by Prof. George T. Atkinson, which only has the right leg changed into a copulatory organ.

9. Fontaria montana, sp. nov.

Diagnosis.—Similar to *Fontaria trimaculata* (Wood) but larger, especially the breadth; dorsal plates less convex, lateral carinæ larger and more produced; legs of male less crassate, shining black, yellow spots very distinct, legs light brown.

Type.—U. S. Nat. Museum.

Habitat.—Wolf Creek, Cooke County, Tenn.

This species is very closely related to *F. trimaculata*, as is shown by the coloration and genitalia, but the latter are more strongly coiled and with the basal spine larger. Comparing the males of the two species, it may be said that in *F. montana* the different parts are larger, but more slender.

I have examined a male collected by Mr. Charles B. Branner. This species is the southern representative of *F. trimaculata*, but it is not probable that they will merge into one as the characters of the male genitalia are too much unlike.

Measurements of Fontaria montana.

Sex.	Length of body.	Width of first segment.	Width of tenth segment.	Length of antennæ.	Habitat.
	mm.	*mm.*	*mm.*	*mm.*	
♂	45	8.9	12.5	7.8	Wolf Creek, Tenn.

Measurements of Fontaria trimaculata (Wood).

♂	38.2	6.3	7.8	7	Syracuse, N. Y.
♀	38.8	6.4	7.6	5.4	Do.

10. Geophilus oweni, sp. nov.

Diagnosis.—(Frontal plate present, anal pores absent); coxal pores present, large and small, placed along and partly concealed by last ventral plate; pairs of legs, ♂ 67, ♀ 71.

Type.—U. S. Nat. Museum.

Habitat.—New Harmony, Posey County, Ind.

Description of type.—Orange, head darkest. Slender, slightly attenuated posteriorly, smooth, legs sparsely pilose. Prehensorial legs sparsely pilose and punctate, swollen; sternum wider than long (8: 7); coxa a little longer than wide (3.5: 3), unarmed; tooth small, acute. Cephalic plate quadrate, scarcely narrowed anteriorly; posterior end broadly truncate, slightly emarginate, and concealing part of basal plate; basal plate nearly thrice as wide as long.

Antennæ short, joints moderately long, penult. and antepenult. subequal. Dorsal plates sparsely punctate, bisulcate; anterior predorsal plates short; median, one and a half times as long, posterior twice. Spiracles round, anterior moderately large, median and posterior small.

First pair of feet short, robust, anterior and posterior subequal, but former stouter; anal legs armed. Coxa of anal legs considerably swollen, posterior border densely pilose; pores about ten, large and small and mostly concealed by last ventral plate; last ventral plate wide (3: 2), side barely rounded and converging, pilose.

Pairs of legs: ♂, 67, slightly crassate, densely pilose; ♀ 71, slender and sparsely pilose. Length of ♂ 30mm, width 1mm; ♀, length 43.5mm, width 1.2mm.

This species is described from a male and female collected by Dr. Richard D. Owen, of New Harmony, Ind., and to whom I have the pleasure of dedicating it. I have thought it best to introduce the following analytical key in order to show the relations of *G. oweni* as well as those of some others recently described, belonging to that section of *Geophilus* which has the last ventral plate wide.

Last ventral plate wide.

a. Frontal plate present.

b. Anal pores absent.

Coxal pores two; anal legs of male strongly crassate; pairs of legs, ♂ 47 to 49, ♀ 51 to 53; dorsal plates with a broad, double, black median line ..... *cephalicus* WOOD.

cc. Coxal pores more than two.

d. Pairs of legs, ♀ 51; coxa of anal leg not strongly inflated, pores large, ten or twelve, subseriate ..... *mordax* MEINERT.

dd. Pairs of legs, ♀ 71, ♂ 67; coxa of anal legs strongly inflated; pores about same number, large and small, partly concealed by ventral plate ..... *oweni* BOLLMAN.

aa. Frontal plate absent.

b. Anal pores absent.

c. Coxal pores absent; coxa of prehensorial legs armed; pairs of legs, ♂ 67 to 69, ♀ 61 to 65 ..... *bipuncticeps* WOOD.

cc. Coxal pores present.

d. Coxal pores one, concealed; prebasal plate concealed; coxa of prehensorial feet twice as long as wide; pairs of feet, ♀ 61.. *georgianus* MEINERT.

dd. Coxal pores two.

e. Prebasal plate concealed; anterior coxal pore hidden by ventral plate; teeth of prehensorial legs distinct; pairs of legs, ♂ 67 to 69, ♀ 61 to 66 ..... *perforatus* (MCNEILL).*

ee. Prebasal plate exposed as in *cephalicus;* coxal pores like *perforatus;* teeth of prehensorial legs very indistinct; pairs of legs, ♂ 61, ♀ 63 ..... *okolonæ* BOLLMAN.†

bb. Anal pores present; coxal pores arranged in two partly covered series; pairs of legs, ♀ 61 ..... *latro* MEINERT.

11. Geophilus californiensis, sp. nov.

Diagnosis.—(Frontal plate absent; anal pores present); attenuated from head backwards; coxa of prehensorial legs unarmed; antennæ long; coxal pores rather large, over 30; pairs of legs, ♀ 64 to 67.

Type.—U. S. Nat. Museum.

Habitat.—Ukiah, Cal.

This species may be easily separated from those which have the "frontal plate absent and anal pores present" by the characters assigned in the diagnosis.

The following is a complete description of type:

Reddish orange, head darkest, rather robust, widest before, moderately smooth, sparsely pilose. Prehensorial legs reaching to base of second antennal joint; coxa longer than wide (4.5:3), unarmed; tooth small. Cephalic plate sparsely pilose and punctate, the latter forming two sulcations, longer than wide (7:5); basal plate partly concealed, thrice as wide as long; prebasal not exposed. Antennæ long, joints long, penult. and antepenult. shortened.

Dorsal plates distinctly bisulcate; anterior predorsal plates short, posterior longest; ventral plates with an indistinct median depression. Spiracles round, anterior large, median and posterior small. First pair of legs short, anterior and posterior subequal, former stouter.

Coxa of anal legs strongly swollen, pores rather large, over 30; last ventral plate moderately wide (1.5:2), sides converging.

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* *Schendyla? perforatus* McNeill, Proc. U. S. Nat. Mus., 325, 1887. (Pensacola, Fla.)

† *Geophilus okolonæ* Bollman. Ent. Amer., 5, 1888. (Okolona, Ark.)

[illegible] Length of male, 3.5[illegible]; width 1.2[illegible].

[illegible] number of specimens collected by Mr. J. H. Burke, [illegible] species should be placed near *G. occidentalis* Meinert, although it seems to bear little relation to the latter.

2. [illegible]

[illegible] Stuxberg, but the claw of female [illegible] spines of anal feet 1, 3, 3, 0; coxal pores more [illegible]

[illegible] U. S. Nat. Museum.

[illegible] Brazil.

[illegible] type.—Brown, feet paler. Slender, moderately rough [illegible] Antennæ short, articles [illegible] Prosternal teeth [illegible] laterally armed. Coxal pores 3, [illegible] Spines of first pair of feet 1, 2, 1; [illegible] anal pair 1, 3, 3, 0. Claw of female [illegible] stout and short, inner shortest.

[illegible] width 1.1 to 1.3[illegible]; antennæ 3 to 3.5[illegible]; [illegible]

I have examined a number of specimens collected by Mr. Carl H. [illegible], to whom I take great pleasure in dedicating this species.

13. [illegible]

[illegible] Anal and penultimate pairs of legs each armed with a single claw; joints of antennæ 26, color chestnut.

Type.—U. S. Nat. Museum.

Habitat.—Balsam, Jackson County, N. C.

Description of type. Chestnut, head and antennæ of a deeper shade, [illegible] Slender, dorsal plates moderately smooth, especially anterior, very sparsely pilose; head obcordate, length and width subequal. Antennæ short, reaching to fifth segment, joints 26, small. Prosternal teeth 3 + 3, small. Coxa of the (?) pairs of feet [illegible] armed. Coxal pores 4, 3, 3, 4, small and round. Spines of first pair of legs 2, 1, 1; penultimate and anal pairs 1, 3, 3, 2. Anal legs [illegible] smooth, tarsæ of anal and penultimate pairs of legs sulcate [illegible] side. Claw of female genitalia short, tripartite; spines 2 + 2, [illegible] shortest.

[illegible] of body 12.5[illegible], width 1.8[illegible]; antennæ 4[illegible]; anal legs 5[illegible].

[illegible] species bears no relation to any known from North America; [illegible] it is the only one of the subgenus *Lithobius* with the penultimate pair of legs armed with a single claw.

[illegible] examined one specimen collected by Prof. George F. Atkinson, [illegible] of North Carolina, to whom I have the honor of dedi-

[illegible]

14. Lithobius tyrannicus, sp. nov.

Diagnosis.—Related to *Lithobius latzeli* Meinert, but the coxal pores transverse; claw of female genitalia much longer and indistinctly tripartite; size larger.

Type.—U. S. Nat. Museum.

Habitat.—Greencastle, Bloomington, Salem, and New Providence, Ind.

Description of type.—Brown, more chestnut than *L. latzeli;* legs fulvous. Robust, rough, especially posteriorly; head wider than long (6:5). Antennæ moderately long, attenuate, joints 31 to 36, short. Ocelli 32–7 to 45–9. Prosternal teeth 6 + 6 to 8 + 8. Coxa of anal legs unarmed beneath, those of the 13, 14, 15 legs laterally armed. Spines of first pair of legs 2, 2, 1; penultimate and anal pairs 1, 3, 3, 1 or 1, 3, 3, 2. Coxal pores: ♂, 6, 7, 7, 5 to 8, 8, 8, 6; ♀, 7, 8, 8, 7 to 8, 9, 8, 7.

Male: Femur, tibia, and first tarsal joints of anal legs sulcate beneath, last two tarsal joints sulcate on inner side, tibia depressed and sulcate above; penultimate pair of legs the same, but tibia not flattened and sulcate above.

Female: Anal and penultimate pairs of legs similar to the penultimate pair of male; claw of genitalia long and stout, indistinctly tripartite, middle lobe much longer, inner smallest.

Length of body 18.5 to 26$^{m.m}$, width 2.5 to 3.8^{mm}; antennæ 8 to 12^{mm}; anal legs 9 to 12^{mm}.

I have compared this species with a series of *L. latzeli* from Chapel Hill, N. C., and find in the latter the following differences worthy of notice: Coxal pores ♂, 4, 5, 5, 4 to 6, 6, 6, 5; ♀, 5, 5, 6, 5, to 5, 7, 6, 5; of female genitalia rather short and wide, distinctly tripartite, middle claw lobe somewhat the longest.

Length of body 16 to 22^{mm}, width 1.8 to 2.6^{mm}; antennæ 8 to 11^{mm}, anal legs 7.8 to 10^{mm}.

My description of *Lithobius mordax*, Proc. U. S. Nat. Mus. 262, 1887, applies in part to this species.

As several other species belonging to the subgenus *Neolithobius* have been recently described, I have compiled the following analytical key to help elucidate a few points as well as to correct some errors:

ANALYSIS OF THE SPECIES OF NEOLITHOBIUS.

a. Anal legs armed with a single claw, coxæ not armed beneath.
  b. Coxal pores in a single series, round.
    c. Penultimate pair of feet armed with a single claw; antennæ 30 to 40, jointed; prosternal teeth 5 + 5 or 6 + 6; last two tarsal joints of anal legs sulcate on inner side.....*transmarinus* KOCH.
    cc. Penultimate pair of feet armed with a double claw.
      d. Prosternal teeth 4 + 4 or 5 + 5; antennæ 26 to 34, jointed; tarsal joints of anal legs not sulcate; orange or light chestnut.....*clarus* MCNEILL.
      dd. Prosternal teeth 6 + 6 to 8 + 8; antennæ 32 to 35, jointed; tarsal joints of anal legs sulcate on inner side, brown.....*latzeli* MEINERT.

bb. Coxal pores in a single series, transverse.

c. Penultimate pair of legs armed with a single claw; antennæ 30 to 38, jointed; prosternal teeth 6+6 or 7+7; last two tarsal joints of anal legs distinctly or not sulcate ..... *mordax* KOCH.

cc. Penultimate pair of legs armed with a double claw.

d. Last two tarsal joints of anal legs sulcate on inner side, likewise the penultimate pair; antennæ 31 to 36, jointed; prosternal teeth 6+6 to 8+8; length of body 18 to 26mm ..... *tyrannicus* BOLLMAN.

dd. Last two tarsal joints of anal and penultimate pairs of legs not sulcate; antennæ 40 to 49, jointed; prosternal teeth 6+6 to 11+11; length of body 20 to 37mm ..... *vorax* MEINERT.

bbb. Coxal pores in several series; claws of penultimate pair of feet two; joints of antennæ 40 to 47; ocelli 13–4 to 26–5; prosternal teeth 8+8 to 10+10; claw of female genitalia not divided ..... *terreus* FEDRIZZI.

aa. Anal and penultimate pairs of legs each armed with two claws; coxal pores in a single series, round; coxa not armed beneath; antennæ 31 or 32, jointed; prosternal teeth 2+2; spines of first pair of feet 1, 1, 1. *juventus* BOLLMAN.

In the above key I have introduced the European species, *Lithobius terreus* Fedrizzi; I can not find any true specific characters to separate *Lithobius leptopus* Latzel from it.

Concerning the geographical distribution of these species I may say that *transmarinus* has been found in Louisiana, Arkansas, and Indian Territory; *clarus* in Florida; *latzeli* in Virginia and North Carolina; *mordax* from Florida to Indian Territory, then north to Minnesota; *tyrannicus* in Indiana; *vorax* from Mississippi to Indian Territory; and *juventus* in Indiana and Tennessee.

INDIANA UNIVERSITY, *January* 20, 1888.

[From Ann. N. Y. Ac. Sc., IV, 1887, pp. 25–44.]

NOTES ON NORTH AMERICAN JULIDÆ.

BY CHARLES H. BOLLMAN.

[Read February 28, 1887.]

The following paper is based upon material of this family embraced in the entomological collection in the Museum of the Indiana University.

In connection with the description of the new species, it has also been deemed best to introduce descriptions of those already known to science.

The types of the new genera and species are deposited in the above museum.

Family A.—JULIDÆ Leach.

Genus I.—JULUS Linn.

Julus Linnæus, Syst. Nat., Ed. X, I, 639, 1758.

This genus differs from *Parajulus* in the mandibulary combs being four; the first segment of an equal size in both sexes; the second pair of feet not stunted; and the first pair of the male small, three-jointed, the last joint large and uncinate.

As the subgenera of this genus are very much confused, I have not attempted to give a key to those to which the following species belong.

1. **Julus Owenii**, sp. nov.

Pale brown, a lateral series of dark brown spots, first dorsal plate with a brown band along the anterior border; a brown band between the eyes; a pale oval spot at the base of antennæ; feet and antennæ pale. Moderately slender, not smooth, not pilose. Vertex rough; a faint median sulcus; setigerous foveolæ absent. Antennæ subclavate, equal to the width of body. Eyes indistinct, subcircular; ocelli not always filled out, about 28, arranged in 6 or 7 series. Segments 38–40. First segment unusually thin, advanced forward to the eyes; sides striate. Other segments moderately striate both above and below. Last segment rounded; anal valves not marginate, not pilose; anal scale triangular. Repugnatorial pore moderately large, longitudinally oval, touching the transverse suture, which is excised. Pairs of feet 54–66, rather stout, equaling the width of body. *Male*: mandibulary

stipes not much produced beneath. First pair of legs small, strongly uncinate. Genitalia concealed. Length of body 11.4–13.5^{mm}; width, 7–8^{mm}.

Habitat.—New Harmony, Indiana.

I have examined two males of this species, collected by Dr. Richard Owen, of New Harmony, Indiana, after whom the species is named.

This species belongs to the sub-genus *Allajulus* as defined by Latzel.

2. Julus virgatus Wood.

Julus virgatus Wood, Proc. Acad. Nat. Sci., Phila., 14, 1864.

Fulvous-brown, a black median and two lateral bands, a dark band between eyes; joints of antennæ tipped with black, feet pale. Slender, nearly smooth; a row of hairs along the posterior border of each segment. Vertex smooth; a faint median sulcus; setigerous foveolæ present. Antennæ moderate, subclavate, equaling width of body. Eyes distinct, triangular or trapezoidal; ocelli 25–40, arranged in 6–7 series. Segments 30–35. Sides of first segment marginate; other segments striate both above and below, but more so in the latter; last segment rather sharply rounded, sparsely pilose; anal valves scarcely marginate, smooth, pilose; anal scale triangular, rather large, pilose. Repugnatorial pore small, partly concealed by the transverse suture, which is moderately excised. Pairs of feet, 50–65, not equaling width of body, rather stout, sparsely pilose. *Male:* mandibulary stipes moderately produced beneath. First pair of feet short, scarcely thickened, strongly uncinate. Genitalia half concealed; anterior plate entirely concealed, except the end; large, flat, the ends turning outwards, rounded; posterior plate composed apparently of three pieces, strongly twisted together at base, anterior part expanded at the end, ending in an inward curving spine, middle part not expanded, end pointed, posterior blade-like, pointing inwards and projecting out on the inner side of the others, the tip rounded. Flagellum not detected. Length of body, 8–12^{mm}; width, .7–1^{mm}.

Habitat.—Pennsylvania, District of Columbia, and Indiana.

I have examined numerous specimens of this species from Bloomington, Indiana, where it seems to be common in orchards and pastures having a thick growth of grass.

The females are considerably more robust than the males.

3. Julus minutus Brandt.

Julus pusillus Say, Journ. Acad. Nat. Sci., Phila., 106, 1821 (preoccupied).
Julus minutus Brandt, Recueil, 89, 1840.

Brown, a lateral row of ovate, black spots; feet pale; antennæ black and white; a dark band and three white spots, forming a △ between
ss. Slender, finely wrinkled above, not pilose. Vertex with a
nt median sulcus; setigerous foveolæ absent. Antennæ mod-
qualing the width of body. Eyes distinct; ocelli, 8 or 9, ar-

ranged in a single, longitudinal, curved series behind the antennæ. Segments, 35–45; sides of the first segment striate; other segments moderately striate beneath; last segment rounded, pilose; anal valves not marginate, pilose; anal scale small, rounded, pilose. Repugnatorial pore placed in the posterior division, small, not touching the transverse suture, which is straight. Pairs of feet, 55–70; slender, not extending beyond the sides of body, sparsely pilose. Length of body, 9–12^{mm}; width, 0.5–0.8^{mm}.

Habitat.—Virginia, Florida, and Indiana.

I have examined a number of females of this species from Bloomington, Ind., and also the types of *Julus lineatus* McNeill, Mss. (Pensacola, Fla.), but I can not find any difference between them and my other specimens, which I have identified with *minutus*. Specimens not in full color have the lateral row of spots bronze-red, and with a backward-pointing branch, at the upper posterior side.

Young individuals differ as follows:

Length.	Width.	Eyes (ocelli).	Segments.	Pairs of legs.
mm	*mm*			
6.2	0.4	5	32	46
6.3	0.5	5	33	48

4. Julus stigmatosus Brandt.

Julus punctatus Say, Journ. Acad. Nat. Sci. Phila., 102, 1821 (preoccupied).
Julus stigmatosus Brandt, Recueil. 88, 1840.

Pale brown; posterior border of segments dark; a lateral row of brown spots; antennæ dark, feet pale. Slender, smooth, shining, not pilose. Vertex without a median sulcus, setigerous foveolæ present. Antennæ subclavate, exceeding the width of body. Eyes distinct, triangular or subrotund; ocelli 20–40, arranged in 5–7 series. Segments, 35–45. Sides of first segment striate. Other segments moderately striate beneath; last segment smooth, obtusely rounded, pilose; anal valves not marginate, pilose; anal scale small, rounded, pilose. Repugnatorial pore small, placed in the posterior division, not touching the suture, which is straight. Pairs of feet, 50–75, slender, extending beyond the sides of body, sparsely pilose. *Male:* mandibulary stipes not much produced beneath. First pair of legs short and thick, uncinate, sparsely pilose. Genitalia exposed. Length of body, 8–13^{mm}; width, 0.5–0.8^{mm}.

Habitat.—Virginia and Indiana.

I have examined about a dozen specimens of this species. It varies somewhat in the shades of color, some being almost black. Only having one full grown male, I have not attempted to give a description of the genitalia.

One young specimen differs from the adult as follows:

Length, 7^{mm}; width, .4^{mm}; eyes (ocelli), 19–5; segments, 33; feet, 38.

Genus II.—SPIROBOLUS Brandt.

Spirobolus Brandt, Bull. Soc. Imp. Nat. Mos., 202, 1833.

The subgenera are defined as follows:

a. Basal part of the dorsal plates without scobina.....SPIROBOLUS Karsch.
aa. Basal part of the dorsal plates with scobina.....RHINOCRINUS Karsch.

Subgenus *Rhinocrinus*.

5. Spirobolus marginatus (Say).

Julus marginatus Say, Journ. Acad. Nat. Sci. Phila., 105, 1821.
Spirobolus marginatus Wood, Trans. Amer. Philos. Soc., 207, 1865.

Dark brown; segments edged with brownish fuscous; first and last segments green or brown; feet and antennæ brownish-red. Robust, not attenuated anteriorly, the anterior four or five segments somewhat depressed, not smooth. Vertex smooth, with faint reticulating lines, sparsely punctate, most numerous between and behind eyes; median sulcus interrupted; clypeal foveolæ 8–10. Antennæ short, not reaching the posterior border of first segment. Eyes indistinct, subtriangular; ocelli, 30–40, arranged in 6 series. Segments, 47–52. First segment with the sides subacute, marginate, the anterior border nearly straight, densely punctate; second segment produced forward into a moderately large subquadrate plate. Other segments equally punctate on both divisions, striæ moderate, decurved beneath. Last segment pointed, but not extending beyond the anal valves, finely punctate; anal valves marginate; punctate; anal scale obtusely angled, punctate. Repugnatorial pore placed on the anterior division, large, transverse suture bent. Pairs of feet, 88–100, extending beyond the sides of body. *Male:* the two anterior pairs of feet more robust than the rest; coxæ of the 3–4 pairs most produced. Ventral plate produced into a short, rounded lobe. Genitalia: internal part of the anterior plate not higher than the ventral plate, external part with the tip somewhat rounded, produced backwards and outwards; posterior plate divided at the base, the outer grooved, through which runs the inner, ends of both rounded and more or less roughened. Length of body, 45–100^{mm}; width, 5–10^{mm}.

Habitat.—Eastern United States.

I have examined numerous specimens of this species from Bloomington, Ind., and one large female from Brooksville, Ind., collected by Mr. Amos Butler. Specimens 50^{mm} long differ in color from the full grown examples, by being dark green.

Young individuals differ from adults as follows:

Length.	Width.	Segments.	Pairs of feet.	Eyes.
mm.	*mm.*			
18	2	42	76	18–5
16.5	2	41	65	21–5
16	2	39	62	19–5
8	1	27	32	6–3

6. Spirobolus pensacolæ, sp. nov.

Dark green above, segments margined with reddish-brown; face, anterior and posterior segment bright green; feet and antennæ lighter than in *marginatus*. Moderately robust, attenuated before, the twelve anterior segments somewhat flattened or crassate beneath, not smooth. Vertex smooth, sparsely punctate; punctations not more numerous between the eyes, median sulcus interrupted; clypeal foveolæ 8. Antennæ short, not quite reaching the posterior margin of anterior segment. Eyes distinct, trapezoidal; ocelli, 45, arranged in 7 series. Segments, 49. First segment with the sides subacute, marginate, anterior border sinuate; second segment with the lobe less broad and more triangular than in *marginatus*. Other segments moderately rough, punctations most numerous on the posterior division; striæ decurved, strong and rib-like on the posterior division of the segments. Last segment pointed, not passing the anal valves, densely punctate; anal valves marginate, rough; anal scale rounded. Repugnatorial pore large, placed on the anterior division; suture moderately bent. Pairs of feet, 92, moderately extending beyond the sides of the body. Length of body, 80^{mm}; width, 9^{mm}.

Habitat.—Pensacola, Florida.

I have had one female of this species for examination. It is more related to *marginatus* than any other of our North American species. From *marginatus* this species is easily separated by the distinct attenuated body, clypeal foveolæ, form of second segment, arrangement of the ocelli, and color.

7. Spirobolus uncigerus Wood.

Spirobolus uncigerus Wood, Proc. Acad. Nat. Sci. Phila., 15, 1864 (California).

Dark brown, edge of segments lighter, an indistinct light median line; feet chestnut. Moderately robust, a little crassate, not attenuated, only a few anterior segments flattened beneath, not smooth. Vertex moderately smooth, distinct reticulating lines, sparsely punctate, median sulcus interrupted; clypeal foveolæ 8. Antennæ short, not reaching the posterior border of anterior segment. Eyes indistinct, subtriangular; ocelli, 32, arranged in 7 series. Segments, 49. First segment with the sides acute, marginate, anterior margin excised, rough, densely punctate; second segment moderately produced beneath, rounded in front. Other segments rough, densely punctate; numerous short lines, striæ strong, not much decurved. Last segment acutely rounded, not passing the anal valves, densely punctate; anal valves marginate; anal scale rounded. Repugnatorial pore moderately large, placed in the anterior part, sulcus extending backwards, deep, transverse suture bent. Pairs of feet, 86, equaling the width of body. *Male:* coxæ of the third pair of feet produced from beneath into a long, spatulate appendage. Ventral plate moderately produced in the middle into a sharp point. Genitalia: inner part of the anterior plate

twice as high as ventral plate, inner angle somewhat pointed, rough, external part somewhat curved, the tip a little produced, rough; posterior plate sickle-shaped, the end slender and sharp, serrated beneath at about the middle. Length of body, 45mm; width, 5mm.

Habitat—Ukiah, California.

I have examined one male of this species from the above locality, which was collected by Mr. James K. Burke.

8. Spirobolus hebes sp. nov.

Dark ochreous brown, segments not edged with a different color; a lateral row of small black spots; feet lighter. Robust, not attenuated; the anterior 2–5 segments somewhat crassate, not smooth. Vertex smooth, sparsely punctate, median sulcus interrupted; clypeal foveolæ 8. Antennæ short, about reaching the posterior margin of anterior segment. Eyes distinct, subtriangular, sides rounded; ocelli 29–38, arranged in 6 series. Segments 39–41. First segment acute, more so in male than female, marginate, rather smooth; second segment strongly produced beneath, triangular and rounded. Other segments not smooth, sparsely punctate, also numerous impressed lines, striæ moderate, strongly decurved beneath. Last segment obtusely rounded, moderately smooth; anal valves not marginate; anal scale rounded. Repugnatorial pore small, placed in the anterior division, suture angularly bent. Pairs of feet, 76–79, not extending beyond the sides of body. *Male:* coxæ of the 3–6 pairs of feet produced more than the others; trochanter of the first and second pairs large, as well as the two anterior pairs of legs are stouter than the rest. Ventral plate smooth, triangular, somewhat swollen near the outer edge. Genitalia: inner part of the anterior plate twice as high as the ventral plate, end rounded, numerous short tubercles on the anterior surface, outer part finger-like, moderately wide, end rounded and not turned outwards, smooth; posterior plate thick and somewhat curved, a short blunt lobe at base on the inner side, above this a sharp and thin one, the end small, thick and rounded, beneath produced into two serrated plates. Length of body, 45–50mm; width, 7–8mm.

Habitat—San Diego, California.

This species is described from a male and a female, collected by Miss Rosa Smith.

9. Spirobolus californicus (Humbert and Saussure).

Spirostreptus californicus Humb. & Sauss., Revue et Mag. Zool., 177, 1870 (California).

Black, segments not edged with rufous, feet and antennæ not or scarcely paler. Robust, not attenuated before, a few of the anterior segments crassate, not smooth. Vertex rough between the eyes, smooth elsewhere, a few wrinkles in front, median sulcus interrupted; clypeal foveolæ 8. Antennæ moderate, reaching the posterior border of ante-

rior segment. Eyes indistinct, sub circular; ocelli 45, arranged in 8 series. Segments, 48. Sides of first segment acute, marginate, anterior border sinuate, moderately smooth; second segment strongly produced and turned forwards, the lobe quadrate. Other segments densely punctate, and with numerous short lines; striæ moderate, concentric. Last segment rounded, smooth; anal valves not marginate; anal scale transverse. Repugnatorial pore small, placed in the anterior division, suture bent. Pairs of feet, 90, about equaling the width of body. Length of body, 75^{mm}; width, 10^{mm}.

Habitat—St. Vincent, Lower California.

I have one broken example of this species from the above locality, collected by Mr. Charles R. Orcutt, of San Diego, Cal. The specimen before me agrees with the short description given in the journal cited above.

10. Spirobolus spinigerus Wood.

Spirobolus spinigerus Wood, Proc. Acad. Nat. Sci. Phila., 15, 1864 (Florida and South Carolina).

Dark greenish brown or black, segments edged with brownish red, feet and antennæ red. Moderately robust, anterior segments somewhat attenuate, barely crassate, only the anterior and posterior segments punctate, rest smooth. Vertex smooth, very finely and sparsely punctate, punctations not numerous between eyes, sulcus barely continuous; clypeal foveolæ 10–12. Antennæ moderate, usually reaching the middle of second segment. Eyes indistinct, subtriangular; ocelli, 35–45, arranged in 6 or 7 series. Segments, 45–52. First segment with the sides subacute, marginate, anterior margin sinuate, smooth, finely punctate; second segment not much produced beneath. Other segments smooth, not punctate, striæ of the anterior segments weak, not much decurved, more so posteriorly. Last segment smooth, finely punctate, pointed, but not passing the anal valves; anal valves moderetely smooth, marginate; anal scale rounded. Repugnatorial pore large, placed on the anterior part, suture bent. Pairs of feet, 84–98, not extending much beyond sides of body. *Male:* coxæ of the third and fourth pairs of feet produced into long appendages. Ventral plate produced into a lobe, as in *marginatus*, but longer and more slender. Genitalia: inner part of anterior plate higher than the ventral lobe, rough, sinuate on the upper edge near the outer side, external part with the end curved sharply backwards and outwards; posterior plate divided as in *marginatus*, upper lobe or part grooved, the end rounded, a sharp, robust spine on the inner side, the lower or inner lobe thin, the end angular. Length of body, 60–80^{mm}; width, 5–9^{mm}.

Habitat.—Florida and South Carolina.

I have examined numerous specimens of this species from Pensacola, Florida.

Young examples differ from the adults as follows:

Length.	Width.	Segments.	Pairs of feet.	Ocelli.
mm.	*mm.*			
25	2.5	50	80	24-6
27	3.	49	81	25-6
24	2.5	44	65	15-5
22	2.3	43	70	19-6

Genus III—PARAJULUS Humbert and Saussure.

Parajulus Humbert and Saussure, Revue et Mag. Zool., 155, 1869 (*olmecus*).

Eyes triangular, elliptical or trapezoidal; ocelli numerous, not arranged in more than ten series. Antennæ subfiliform, scarcely subclavate, second joint longest. Mandibulary combs, 9–10. Gnathochilarium scarcely subspatulate; stipes not separated; mentum bipartite, almost hidden; lingual plate separated; lingual lobes denticulated. Number of segments uncertain, 40–70; sides striate. Last segment more or less produced into a spine; anal scale triangular or somewhat rounded. Repugnatorial pore beginning on the sixth segment, placed in the posterior part. Third segment apodous. Feet equaling the width of body, seventh joint longer than third; second pair of feet very strongly stunted or dwarfed. *Male:* First pair of legs enlarged, six-jointed, the fourth largest.

To this genus have been referred our larger species of so-called *Julus;* from the latter genus it is easily separated by the number of mandibulary combs, by the second pair of legs, and the first pair of the male.

This genus is divisible into the following subgenera:

* Male: Promentum very large, ovate, narrowing the lingual plates; first segment enlarged, sides very broad, almost subquadrate; first pair of feet very large, crassate, curving inwards and crossing each other, armed with numerous tubercles on the inner side, moderately pilose ..... PARAJULUS I.

** Promentum and first segment same size in both sexes; first pair of feet of male small, stumpy, crassate and straight, tubercles absent, sparsely pilose.
PSEUDOJULUS, subgen. nov. II.

Subgenus *Parajulus.*

11. Parajulus impressus (Say).

Julus impressus Say, Jour. Acad. Nat. Sci., Phila., 103, 1821.

Chestnut brown, the median line and a lateral row of spots black, also an indistinct row of large dark spots partly covered by the feet; segments above with two short light lines, and pale spots on each side of the lateral line; feet pale; line between the eyes not very dark. Moderately slender, not pilose or smooth. Vertex with a median sulcus, setigerous foveolæ present. Antennæ long and slender, equal to the width of the body, moderately pilose. Eyes distinct, triangular, the

sides somewhat rounded; ocelli, 40–60, arranged in 7–10 series. Segments, 45–55. First segment with the sides striate. Other segments not deeply striate, numerous indistinct wavy striæ above. Last segment with a moderate short spine, not projecting beyond the anal valves, sparsely pilose; anal valves smooth, sparsely pilose, scarcely marginate; anal scale triangular, sparsely pilose. Repugnatorial pore moderate, oval or round, partly hidden by the transverse suture, which is sharply emarginate. Pairs of feet, 70–90, equaling width of body, rather stout, sparsely pilose. *Male*: Mandibulary stipes rather strongly produced beneath. First pair of feet large, long, not much curved, the inner surface with numerous tubercles, a few spinous ones near the base, sparsely pilose. Coxæ of the second pair of feet produced into a long, parallel appendage, the tip rounded, very sparsely pilose. Genitalia fully exposed, composed of three pieces; anterior plate moderately long, round, slightly twisted, the end scarcely clavate, turning outwards, densely pilose; middle plate large and thin, forming a tube; posterior plate sickle-shaped, the end bifid, inner or under edge strongly serrated, a thin lanceolate spine springing from the base. Flagellum not detected. Length of body, 18–32^{mm}; width, 1.8–2^{mm}.

Habitat.—Georgia, Illinois, Indiana, Michigan, and Minnesota.

I have examined specimens of this species from Ludington, Michigan, and Chauncey, Indiana; those from the latter place are larger and darker in color.

Wood's plate of the genitalia does not show the serrations, etc., of the posterior plate, nor the true form of the middle plates.

Specimens not adult vary as follows:

Length.	Width.	Segments.	Pairs of feet.	Ocelli.
mm.	*mm.*			
10.4	.9	48	73	30–6
9.6	.85	47	70	26–6
11.2	.92	46	75	27–6
11.8	.9	45	65	38–7
8.3	.75	40	54	22–5

12. Parajulus ellipticus, sp. nov.

Color almost similar to that of *J. impressus*, but darker, feet pale. Moderately robust, not smooth or pilose, shining, somewhat attenuated before. Vertex smooth, a median sulcus, setigerous foveolæ present. Antennæ not equaling width of body, densely pilose. Eyes distinct, almost elliptical, ocelli somewhat crowded, 40–48, arranged in 6–8 series. Segments, 47. First segment moderately large, sides striate. Other segments rather deeply striate, rough, with numerous short wavy striæ. Last segment produced into a moderately large, robust spine, projecting beyond the anal valves, sparsely pilose; anal valves smooth, not marginate, sparsely pilose; anal scale obtusely triangular, rather large. Repugnatorial pore small, not touching transverse suture, which is

scarcely emarginate. Pairs of feet, 71, extending beyond sides of body, moderately stout, sparsely pilose. Length of body, 28–30 millimeters; width, 2.3–2.5 millimeters.

Habitat.—Fort Snelling, Minnesota.

I have examined two female specimens, collected by Mr. Walter D. Howe.

From *castaneus* it is distinguished by the eyes, repugnatorial pore and anal scale; it is also more robust, and differs somewhat in color.

13. Parajulus castaneus, sp. nov.

Color much as in *J. impressus*, but the lateral line of spots larger and confluent posteriorly, a very dark line between the eyes, feet dark. Moderately slender, rough, not pilose. Vertex very finely wrinkled, a faint median sulcus, setigerous foveolæ present. Antennæ moderate, equaling width of body. Eyes distinct, triangular; ocelli, 54, arranged in 8 series. Segments, 42–51. Sides of first segment striate. Other segments deeply striate; above numerous fine striæ which have a number of short branches. Last segment produced into a moderate spine, which projects beyond the anal valves, not pilose; anal valves not marginate, very sparsely pilose; anal scale obtusely rounded, rather small, pilose. Repugnatorial pore moderate, touching the transverse suture, which is sharply sinuate. Pairs of feet, 66, equaling width of body, rather slender, sparsely pilose. *Male:* Mandibulary stipes strongly produced beneath. First pair of feet large, uncinate, numerous tubercles on the inner surface, pilose. Coxæ of the second pair as in *J. impressus*. Genitalia about half concealed, composed of three parts; anterior plate round, the end strongly clavate, pilose; the middle plate rounded, curving up in front of anterior and then backwards between it, where it expands into an elongate, wavy plate; on the inner side it is divided into three lobes or spines, the anterior large and placed at the beginning of the expansion, the second small and placed near the end, which is somewhat serrated, a lanceolate spine springing from the base; posterior plate whip-like, curving upwards and inwards until they meet, and then outwards. Flagellum not detected. Length of body, 30^{mm}; width, 2^{mm}.

Habitat—Fort Snelling, Minnesota.

I have examined one male and one female, in a broken condition, collected by Mr. George Howe.

14. Parajulus pennsylvanicus (Brandt).

Julus pennsylvanicus Brandt, Recueil, 85, 1841.

Dark brown, a black median line and a lateral row of spots, feet pale. Moderately robust, rough, pilose, each segment except the first having two rows of setigerous foveolæ placed on the posterior division, the first row on the anterior third and the other along the posterior border. Vertex with a faint median sulcus, setigerous foveolæ present. An-

tennæ long, equal to the width of body. Eyes distinct, triangular; ocelli more or less prominent, 40–70, arranged in 8–9 series. Segments, 55–65. First segment with four rows of setigerous foveolæ, sides striate. Other segments moderately striate beneath, posterior division of each segment marked with fine striæ. Last segment produced into a short spine, not projecting beyond the anal valves; not smooth, densely pilose; anal valves not marginate, rough, densely pilose; anal scale, small, rounded, pilose. Repugnatorial pore moderate, partly hidden by the transverse suture, which is rather sharply emarginate. Pairs of feet 100–112, not extending much beyond the width of body, densely pilose. *Male:* Mandibulary stipes strongly produced beneath. First pair of legs large, uncinate, the inner surface with numerous tubercles, pilose. Ventral margin of the seventh segment not much produced. Genitalia exposed; anterior plate thick, rounded, the end somewhat clavate and scooped out, very pilose; posterior plate strongly twisted and rolled, the apex divided into three plates, the anterior lanceolate, not serrated, the others broad and thin, with the edges strongly toothed. Flagellum not detected. Length of body, 20–38^{mm}; width, 1.5–2^{mm}.

Habitat.—Pennsylvania, Virginia, and Indiana.

I have examined numerous specimens of this species from Bloomington, Indiana. *Julus montanus* Cope is identical with this species.

Specimens not adult range as follows:

Length.	Width.	Segments.	Pairs of feet.	Ocelli.
mm.	*mm.*			
24	1.6	60	100	40–7
19	1	47	93	35–7
12	.8	49	83	27–6

15. Parajulus canadensis (Newport).

Julus canadensis Newport, Ann. & Mag. Nat. Hist., 267, 1844.

Dark brown, almost black, sides with a series of yellow, conglomerated spots; feet very pale, antennæ scarcely paler. Rather slender, not smooth, shining, nor pilose. Vertex rough, a slight median sulcus, setigerous foveolæ present. Antennæ short, about equaling width of body. Eyes distinct, triangular; ocelli rather flat, 43–50, arranged in 6–8 series. Segments, 56–57. First segment with sides striate. Other segments moderately striate, numerous tailed-like punctations above. Last segment produced into a large, strong, round, decurved spine, sparsely pilose; anal valves scarcely marginate, pilose; anal scale triangular, pilose. Repugnatorial pore large, not touching the transverse suture, which is broadly but not deeply emarginate. Pairs of feet, 86–93, stout, not equaling the width of body, sparsely pilose. Length of body, 18–25^{mm}; width, 1.3–1.5^{mm}.

Habitat.—Canada and Northeastern United States.

I have examined two females of this species from Ludington, Michigan, collected by Mr. N. B. Pierce.

Subgenus *Pseudojulus*, subgen. nov.

16. Parajulus obtectus, sp. nov.

Julus impressus McNeill, Proc. U. S. Nat. Mus., 1886.

Color as in *J. impressus*, but more bright and not so dark. Robust, attenuated before, not smooth, nor pilose. Vertex with a short median sulcus, setigerous foveolæ present. Antennæ long, somewhat exceeding the width of body. Eyes distinct, triangular or trapezoidal in the larger specimens; ocelli numerous, 40–55, arranged in 7–9 series. Segments, 50–55. Sides of first segment striate. Other segments deeply striate, upper surface as in *impressus*, but the striations not so deep. Last segment produced into a rather large, stout spine, which projects beyond the anal valves; anal valves smooth, scarcely marginate; anal scale moderate, obtusely triangular. Repugnatorial pore large, not touching the transverse suture, which is deeply emarginate. Pairs of feet, 80–95, extending beyond sides of body, moderately slender, sparsely pilose. *Male:* Mandibulary stripes not much produced beneath. First pair of legs small, cone-like, not uncinate, sparsely pilose. Coxæ of the second pair of feet not produced into peculiar appendages. Margin of the seventh ventral segment not much produced. Genitalia concealed. Length of body, 18–35^{mm}; width, 1.8–2.5^{mm}.

Habitat.—Bloomington, Indiana, and Pensacola, Florida.

I have examined numerous females of this species, but only a few males, and I have deemed it best not to give a description of the genitalia.

This species is the type of the subgenus *Pseudojulus*.

17. Parajulus varius, sp. nov.

Light chestnut, a median and a lateral row of spots; segments dark above, with yellow lines; a dark band between the eyes, also two large pale spots, with two smaller ones behind them; vertex or occiput with long, irregular pale spots; feet pale. Slender, not smooth or pilose. Vertex finely wrinkled, a median sulcus, setigerous foveolæ absent. Antennæ moderate, exceeding the width of body. Eyes distinct, triangular; ocelli numerous, 40–75, arranged in 7–9 series. Segments, 50–55. Sides of first segment striate. Other segments not deeply striate beneath, finely wrinkled and striate above. Last segment produced into a moderate, robust spine, barely passing the anal valves; anal valves not marginate; anal scale triangular, large, sparsely pilose. Repugnatorial pore moderate, not touching the transverse suture, which is straight or nearly so. Pairs of feet, 75–90, scarcely extending beyond the sides of body, sparsely pilose. *Male:* Mandibulary stipes not much produced beneath; first pair of feet slightly bent inwards; *genitalia* concealed. Length of body, 25–30^{mm}; width, 1.5–2^{mm}.

Habitat.—San Diego, Cal. (Miss Rosa Smith); Ukiah, Cal. (Mr. James K. Burke); Rosario Mission, S. Cal. (Mr. Charles R. Orcutt).

I have examined two specimens from San Diego, three from Ukiah, and numerous specimens, mostly broken, from Rosario Mission. Those from the latter are almost black in coloration and lack the median and lateral rows of spots, but otherwise there is no difference.

Genus IV.—NANNOLENE, gen. nov.

Eyes triangular; ocelli arranged in several series. Antennæ short, subclavate, joints longer than wide, second and sixth subequal, the latter enlarged as in *Cambala*. Mandibulary combs six (5). Gnathochilarium barely spatulate; stipes separated, attenuated towards the base; mentum entire, exposed; promentum almost as in *Julomorpha*, posterior plate trapezoidal, anterior lanceolate-triangular; lingual plates separated; lingual lobes denticulated. Segments constricted in the middle; the anterior ten segments striate from the feet to the repugnatorial pore, the striæ diminishing on the other segments; at the junction of the anterior and posterior parts are round impressions, larger than the pore, extending around all, except the first 6 or 8; first segment nearly as wide as the next two. Repugnatorial pore beginning on the sixth segment, placed in the posterior part. Fourth segment apodous. Feet long and slender, seventh joint longer than the third. *Male:* First pair of legs about half as long as other, scarcely thickened, same number of joints, unarmed; sixth and seventh pairs of legs with the penultimate joint swollen and produced on the inner side.

This genus seems to be more related to *Cambala* than any other genus, but nevertheless it also approaches *Julomorpha*, especially in the construction of the gnathochilarium. It is distinguished from all the known genera by the first pair of feet of the male.

The following species is the type of the genus:

18. Nannolene burkei, sp. nov.

Light brown, a lateral row of large spots almost encircling the seg, ments, feet and antennæ pale, a brown band between eyes. Slender-not smooth or pilose. Vertex smooth, a faint median sulcus, setigerous foveolæ absent. Antennæ equaling width of body, pilose. Eyes distinct, triangular; ocelli 26, arranged in 5 series, not quite all filled out. Segments 50 or 51. Sides of the first segment with four striæ. Other segments moderately striate beneath, posterior part of the segments with fine striæ. Last segment rounded; anal valves not marginate, pilose; anal scale obtusely rounded, pilose. Repugnatorial pore small, placed on the anterior third of the posterior part of the segment. Pairs of feet, about 87, slender, extending beyond the sides of body. *Male:* Mandibulary stipes slightly produced in the middle; ventral margin of the seventh segment not produced; genitalia concealed. Length of body, 25^{mm}; width, 1^{mm}.

Habitat.—Ukiah, Cal.

I have examined two young males and two adult females of this species. They were collected by Mr. James K. Burke, after whom the species is named. On account of the females being curled in a spiral shape, the number of segments and pairs of legs were counted with uncertainty.

The two young males differ as follows:

Length.	Width.	Segments.	Pairs of feet.	Ocelli.
mm.	*mm.*			
14	.08	44	71	20-4
13	.07	43	68	17-3

Genus V.—CAMBALA Gray.

Cambala Gray, Griffith, Animal King., II, pl. 135, 1832 (*annulata*).

Ocelli arranged in a single series behind the antennæ and parallel with the first segment. Antennæ short, subclavate, the joints longer than wide, the second longest, the sixth stout and nearly as long. Mandibulary combs 6–7. Gnathochilarium somewhat spatulate; stipes attenuated at the base, separated by the promentum; mentum entire, rectangular, nearly concealed by the hypostoma; promentum very large, divided as in *Julomorpha*, posterior division converging more anteriorly, anterior division elongate-triangular; lingual plates separated; lingual lobes denticulated. Segments with sharp, elevated ridges, first and last smooth. Repugnatorial pore very small, placed on an enlarged ridge. Fourth segment footless. Feet moderately elongate, the seventh and third joints subequal. *Male:* First pair of legs six-jointed, the third as long as the fourth and fifth together, the last short, very blunt, unarmed; genitalia about half covered.

From any of our North American genera this may be separated by the dorsal carinæ, the ocelli, and the first pair of legs of the male.

The only species belonging to this genus besides the one here described, is *Cambala nodulosa* Butler, from the Island of Rodriguez.

19. Cambala annulata (Say).

Julus annulatus Say, Journ. Acad. Nat. Sci. Phila., 103, 1821.
Cambala annulata Cope, Proc. Amer. Philos. Soc., 181, 1869.

Light yellowish brown, a lateral row of dark brown spots, carinæ brown, a dark line between eyes, feet and antennæ pale. Slender, cylindrical, not tapering, carinated, not pilose. Vertex without a median sulcus and setigerous foveolæ. Antennæ short, subclavate, about equal to width of body, densely pilose. Eyes distinct; ocelli 4–6, arranged in one line. Segments, 50–65. First segment large, sides [illegible]inate, posterior border with an indistinct row of carinæ. Other

segments deeply sulcate, carinæ acute, anterior part of the segments with fine elevated lines. Last segment rounded, smooth, not pilose; anal valve scarcely marginate, smooth, pilose; anal scale moderate, rounded, pilose. Pairs of feet, 70–112, rather stout, equaling the width of body, sparsely pilose. *Male:* First pair of feet short, last joint blunt, unarmed, a little curved; second pair somewhat longer, armed. Genitalia nearly covered; anterior plate with the edge turned backward, the inner especially, around which curves the flagellum, end of plate divided into two lobes, pilose; posterior plate contorted, divided into two short, thickened lobes, the anterior short and bent at a right angle to the plate, posterior moderately long, a little falciform, pilose. Flagellum, very long, curving around to the front of the anterior plate. Length of body, 26–38^{mm}; width, 1.5–2^{mm}.

Habitat.—Indiana, Virginia, Kentucky, Tennessee, and North Carolina.

Specimens not adult vary as follows:

Length.	Width.	Segments.	Pairs of feet.
mm.	*mm.*	45	77
17.5	1.2	43	67
13.5	1	34	50
16	1		

The following is a catalogue of the species of this family described from North America. I have used the following letters for the different zoögeographical regions:

B.= Boreal or Canadian.
E.= Eastern Province.
En.= Eastern Province, northern part.
Es.= Eastern Province, southern part.
W.= West Indian, etc.
C.= Central Province.
P.= Pacific Province.
C. A.= Central American.

Family A.—JULIDÆ Leach.

Genus I.—JULUS Linnæus.

1. *Julus canaliculatus* Wood. En.
2. *Julus cinerefrons* Wood. P.
3. *Julus cæruleocinctus* Wood. ?
4. *Julus exiguus* Brandt. En.
5. *Julus filicornis* Saussure. C. A.
6. *Julus hortensis* Wood. En.
7. *Julus laqueatus* Wood. En.
8. *Julus milesi* Wood. En.
9. *Julus minutus* Brandt. E.
10. *Julus owenii* Bollman. En.
11. *Julus stigmatosis* Brandt. E.
12. *Julus virgatus* Wood. En.

Genus II.—STEMMIULUS Gervais.

13. *Stemmiulus compressus* Karsch. N.

Genus III.—SPIROSTREPTUS Brandt.

14. *Spirostreptus abstemius* Karsch. W. ?
15. *Spirostreptus ampussis* Karsch. C. A.
16. *Spirostreptus clavipes* Koch. En.
17. *Spirostreptus confragosus* Karsch. W.
18. *Spirostreptus flavicornis* Karsch. W.
19. *Spirostreptus fraternus* (Sauss.). C. A.
20. *Spirostreptus montezumæ* (Sauss.). C. A.
21. *Spirostreptus multiannulatus* (McNeill). En.
22. *Spirostreptus nutans* Koch. En.
23. *Spirostreptus otomitus* (Sauss.). C. A.
24. *Spirostreptus sculpturatus* Karsch. W. ?
25. *Spirostreptus surinamensis* Brandt. W.
26. *Spirostreptus ventralis* Porath. W.

Genus IV.—SPIROBOLUS Brandt.

27. *Spirobolus acutus* (Humb. and Sauss.). W.
28. *Spirobolus? agilis* Cope. Es.
29. *Spirobolus angusticeps* Wood. P.
30. *Spirobolus angusticollis* Karsch. C. A.
31. *Spirobolus arboreus* Saussure). W.
31*b*. *Spirobolus arboreus gundlachi* Karsch. W.
31*c*. *Spirobolus arboreus krugii* Karsch. W.
32. *Spirobolus atratus* (Girard). Es.
33. *Spirobolus aztecus* (Saussure). C. A.
34. *Spirobolus beauvoisi* (Gervais). W.
35. *Spirobolus brevicollis* Voges. C. A.
36. *Spirobolus californicus* (Humb. and Sauss.). P.
37. *Spirobolus caudatus* Newport. N.
38. *Spirobolus chichemecus* (Saussure). C. A.
39. *Spirobolus crassicornis* (Humb. and Sauss.). W.
40. *Spirobolus domingensis* (Humb. and Sauss.). W.
41. *Spirobolus duvernayi* Karsch. W.
42. *Spirobolus excisus* Karsch. W.
43. *Spirobolus facatus* Karsch. W.
44. *Spirobolus flavocinctus* Karsch. W.
45. *Spirobolus fundipudeus* Karsch. W.
46. *Spirobolus gracilipes* Karsch W.
47. *Spirobolus haïtensis* (Gervais). W.
48. *Spirobolus hebes* Bollman. P
49. *Spirobolus heteropygus* (Humb. and Sauss.). C. A.
50. *Spirobolus ignobilis* Humb. and Sauss.). En.
51. *Spirobolus marginatus* (Say). E.
52. *Spirobolus mexicanus* (Saussure). C. A.
53. *Spirobolus miniatipus* Karsch. W.
54. *Spirobolus multifrons* Karsch. W.
55. *Spirobolus mysticus* (Saussure). C. A.
56. *Spirobolus nahuus* (Humb. and Sauss.). C. A.
57. *Spirobolus nietanus* (Saussure). C. A.
58. *Spirobolus olivaceus* Newport. C. A.

59. *Spirobolus ornatus* (Girard). Es.
60. *Spirobolus parcus* Karsch. W
61. *Spirobolus pensacolæ* Bollman. Es.
62. *Spirobolus spinigerus* Wood. Es.
63. *Spirobolus striolatus* (Gervais). C. A.
64. *Spirobolus tepanecus* (Saussure). C. A.
65. *Spirobolus toltecus* (Saussure). C. A.
66. *Spirobolus totonacus* (Saussure). C. A.
67. *Spirobolus tzendalus* (Saussure). C. A.
68. *Spirobolus uncigerus* Wood. P.
69. *Spirobolus vulvanus* Karsch. C. A.
70. *Spirobolus woodi* (Humb. and Sauss.). En.
71. *Spirobolus zapoteus* (Saussure). C. A.

Genus V.—PÆROMOPUS Karsch.

72. *Pæromopus lysiopetalinus* (Karsch). P.

Genus VI.—PARAJULUS Humb. and Sauss.

73. *Parajulus cæsar* (Karsch). W.
74. *Parajulus cæsius* (Wood). Es.
75. *Parajulus canadensis* Newport). En.
76. *Parajulus castaneus* Bollman. En.
77. *Parajulus curiosus* (Karsch) W.
78. *Parajulus diversifrons* (Wood). En.
79. *Parajulus ellipticus* Bollman. En.
80. *Parajulus furcifer* (Harger). P.
81. *Parajulus immaculatus* Wood). En.
82. *Parajulus impressus* (Say) En.
83. *Parajulus obtectus* Bollman. E.
84. *Parajulus olmecus* Humb. and Sauss. C. A.
85. *Parajulus oregonensis* (Wood). P.
86. *Parajulus pennsylvanicus* (Brandt). En.
87. *Parajulus pilosiscutus* (Wood) En.
88. *Parajulus rasilis* (Karsch) N.
89. *Parajulus tarascus* Humb. and Sauss.). C. A. S.
90. *Parajulus varius* Bollman. P.

Genus VII.—NANNOLENE Bollman.

91. *Nannolene burkei* Bollman. P.

Genus VIII.—CAMBALA Gray.

92. *Cambala annulata* (Say). E.

INDIANA UNIVERSITY,
Entomological Laboratory, February 1, 1887.

[From *Entomologica Americana*, I, 1887, pp. 225–228.]

DESCRIPTION OF NEW GENERA AND SPECIES OF NORTH AMERICAN MYRIOPODA (JULIDÆ.)

BY C. H. BOLLMAN.

In examining the material of this family in the museum of the Indiana University and my own collection, I have found that the following species do not appear to be described:

Family A.—JULIDÆ, Leach.

Genus I.—NANNOLENE, gen. nov.

Antennæ short, subclavate, joints longer than wide, second and sixth subequal, the latter enlarged as in *Cambala*. Mandibulary combs 6 (5). Gnathochilarium somewhat spatulate, stipes separated attenuated at the base, mentum entire, exposed, promentum divided almost as in *Cambala* or *Iulomorpha;* lingual lobes denticulated. Segments constricted in the middle, the anterior ten segments striate from the feet to the pore, striæ diminishing on the others; at the junction of the anterior and posterior parts of almost every segment are round impressions, larger than the repugnatorial pore, which extend around all the segments except the anterior 6-8. Repugnatorial pore commencing on the sixth segment, placed in the posterior part. Fourth segment footless. Feet long and slender. Male: First pair of legs short, usual number of joints, somewhat thickened, unarmed; penultimate joint of the sixth and seventh pairs of legs produced on the inner side.

This genus is related more to *Cambala*, than any other, although it approaches *Iulomorpha* in the form of the promentum. The following species is the type:

Nannolene burkei, sp. nov.

Light brown, a lateral row of large brown spots, a brown band between eyes. Slender, not smooth or pilose. Vertex smooth, a faint median sulcus, setigerous foveolæ absent. Antennæ equaling the width of body, pilose. Eyes distinct, triangular; ocelli 2 to 5. Segments 50 or 51. Sides of first segment striate, others moderately striate beneath, posterior margin of each segment with fine parallel striæ. Last segment rounded; anal valves not marginate, pilose; anal scale obtusely rounded, pilose. Repugnatorial pore small, not touching the transverse suture. Pairs of feet about 87, extending beyond the sides of

body. Male: Mandibulary stipes a little produced in the middle; genitalia concealed. Length of body 18^{mm}, width —^{mm}.

Habitat.—Utah; California.

I have examined two adults and two young of this species collected by Mr. James K. Burke, after whom the species is named.

Genus II.—PARAJULUS, Humbt. and Sauss.

To this genus belong our larger species of so-called *Julus*. From the latter genus it is easily separated by the number of mandibulary combs (10), the dwarfed second pair of feet and the form of the first segment of the male with its appendages.

Under the genus *Julus*, Wood says, "In all species in which I have had the opportunity of examining sexes, the form of the first scutum distinguishes them with certainty. In the male its antero-posterior diameter is large, and there are well marked lateral margins running nearly at right angles to the others. In the female the anterior posterior diameter is much less, but laterally the scutum is so produced that the anterior and posterior margins may in most cases be said to meet one another at an angle. The males are further distinguished by a peculiar alteration of the first pair of feet, which are transformed into a pair of very large, thick organs."

By applying this remark to those species of which he had both sexes, we have most of the species known to be in this genus at present. The following is a key to the subgenera:

a. First segment enlarged in the male. First pair of feet of male large, crassate, numerous short tubercles on the inner side ..... PARAJULUS

aa. First segment alike in both sexes. First pair of feet of male short, thick, tubercles absent..... PSEUDOJULUS

Sub-genus *Parajulus*.

2. Parajulus castaneus, sp nov.

Color nearly the same as in *P. impressus* (Say). Moderately slender, rough, not pilose. Vertex finely wrinkled, a faint median sulcus, setigerous foveolæ present. Antennæ equaling the width of body. Eyes distinct, triangular, ocelli 5-4-8. Segments, 42–51. Sides of first segment striated, others deeply striate beneath, above with numerous short lines, which are branched. Last segment produced into a moderate spine, projecting beyond the anal valves, not pilose; anal valves not marginate, pilose; anal scale obtusely rounded, small. Repugnatorial pore moderate, touching the transverse suture, which is sharply sinuate. Pairs of feet 66, equaling the width of body. Male: Mandibulary stipes strongly produced; coxæ of the second pair of feet as in *impressus;* genitalia about half concealed, composed of three plates; anterior plate round, clavate, pilose; middle plate curving up in front of anterior, and expanding between them into an elongate plate, which has three

lobes or spines on the inner side, the first large, the second small and right behind it, the last small, placed near the end; posterior plate curving upwards and inward till they meet and then outwards, end not bifid. Flagellum not detected. Length of body 23mm; width, 2mm.

Habitat.—Fort Snelling, Minnesota.

I have a male and female collected by Mr. George Howe. On account of the bad condition of the female, the ocelli and pairs of feet could not be counted.

Sub-genus *Pseudojulus*, subgen. nov.

3. Parajulus obtectus, sp. nov.

Color as in *impressus*, but more bright. Robust, attenuated anteriorly, not smooth or pilose. Vertex with a median sulcus, setigerous foveolæ present. Antennæ exceeding the width of body. Eyes distinct, triangular; ocelli 40–55, arranged in 7–9 series. Segments 50–55. Sides of first segment striate; other segments deeply striate, upper surface almost as in *impressus*. Last segment produced into a rather large and robust spine, projecting beyond the anal valves; anal valves smooth, barely marginate; anal scale moderate, obtusely triangular. Repugnatorial pore large, not touching the transverse suture, which is deeply marginate. Pairs of feet 80–95, extending beyond the sides of body. Male: Mandibulary stipes not produced much beneath; coxæ of the second pair not drawn out; genitalia concealed. Length of body, 18–30mm; width, 1.8–2.2mm.

Habitat.—Bloomington (Indiana) and Florida.

I have examined a large number of females, but only a few males, and I have not attempted to give a description of the genitalia.

4. Parajulus varius, sp. nov.

Color as in *impressus*, but of a different shade. Slender, not smooth or pilose. Vertex finely wrinkled, a median sulcus, setigerous foveolæ absent. Antennæ exceeding the width of body. Eyes distinct, triangular; ocelli 40–75, arranged in 7–9 series. Segments 50–55. Sides of first striate; others not deeply striate beneath; finely wrinkled and striate above. Last segment produced into a moderate spine, barely passing the anal valves, anal valves not marginate; anal scale large, triangular, sparsely pilose. Repugnatorial pore moderate, not touching the transverse suture, which is nearly straight. Pairs of feet 75–90, scarcely extending beyond the sides of body. Male: Mandibulary stipes not much produced beneath; genitalia concealed. Length of body, 18–24mm; width, 1.5–1.8mm.

Habitat.—San Diego, California (Miss Rosa Smith); Ukiah, California (Mr. James K. Burke); Rossario Mission, Lower California (Mr. Charles Orcutt.)

I have examined two specimens from San Diego, three from Ukiah, and numerous specimens mostly broken from the latter locality. Those

from the last place are very dark in color, but otherwise they do not differ.

Genus SPIROBOLUS, Brandt.

Subgenus *Rhinocrinus*, Karsch.

5. Spirobolus pensacolæ, sp. nov.

Above dark green, segments margined with reddish brown, face, anterior and posterior segments bright green, feet lighter than in *marginatus*. Moderately robust, attenuated before, about twelve anterior segments crassate beneath, not smooth. Vertex smooth, sparsely punctate, median sulcus interrupted; elytral foveolæ 8. Antennæ short. Eyes trapezoidal; ocelli 45–7. Segments 49. First segment sulcate, anterior border sinuate; second segment with the lobe not so broad and more nearly triangular than in *marginatus*. Other segments rough, punctation most numerous on the posterior half; striæ decurved; strong on the posterior half. Last segment pointed, densly punctate; anal valves marginate; anal scale rounded. Repugnatorial pore large. Pairs of feet 92, extending beyond sides of body. Length of body, 86^{mm}; width, 9^{mm}.

Habitat.—Pensacola, Florida.

This species is described from one female, collected by the author in the spring of 1886. It is in all related to *marginatus* rather than any other of our species.

Spirobolus hebes, sp. nov.

Ochraceous brown, a lateral row of spots, feet light. Robust, not attenuate, somewhat crassate, not smooth. Vertex smooth, sparsely punctate, median sulcus interrupted; clypeal foveolæ 8. Antennæ short. Eyes subtriangular; ocelli 29–38, arranged in 6 series. Segments 39–41. First segment acute, more so in the male than in the female; second segment strongly produced beneath; almost subquadrate, rounded. Other segments sparsely punctate, numerous short lines above, striæ decurved. Repugnatorial pore small. Pairs of feet 76–79, short. Male: Coxæ of the 3–6 pairs of feet most produced; ventral plate smooth, triangular. Genitalia inner part of anterior plate rough, twice as high as ventral plate, external part with the end rounded and not produced; posterior plate thick, a little bent, the end small and rounded, beneath are two serrated lobes and below these a hard and a blunt lobe. Length of body, 45–48^{mm}; width, 7–8^{mm}.

Habitat.—San Diego, California.

I have examined a male and female of this species collected by Miss Rosa Smith.

JULUS Linnaeus.

Julus owenii, sp. nov.

Pale brown, a lateral row of spots, a pale oval spot at the base of antennæ. Slender, not smooth, not pilose. Vertex rough, a faint median

sulcus; setigerous foveolæ absent. Antennæ subclavate, equaling the width of body. Eyes indistinct, subrotund; ocelli not all filled out, about 28–6 or 7. Segments 38–40. First segment thin, striate. Other segments striate above and beneath. Last segment rounded; anal valves not marginate; anal scale triangular. Repugnatorial pore large, touching transverse suture, which is excised. Pairs of feet 54–66, equal to the width of body. Male: Mandibulary stipes not much produced; first pair of legs small, uncinate; genitalia concealed. Length of body, 9.2–16.6^{mm}; width, 0.6–.07^{mm}.

Habitat.—New Harmony, Indiana.

This species is described from two males collected by Dr. Richard Owen. It is related to *Julus hortensis* Wood.

[From *Entomologica Americana*, II, 1887, pp. 45–46.]

NEW GENUS AND SPECIES OF POLYDESMIDÆ.

BY CHARLES H. BOLLMAN.

In examining the material of this family in the museum of the Indiana University and my own collection, I have found the following new species. The types are deposited in the museum of the Indiana University.

Genus I.—POLYDESMUS Latreille.

1. Polydesmus nitidus sp. nov.

Dark shining brown, beneath lighter, lateral plates reddish-brown; antennæ dark. Moderately slender and depressed, acuminate anteriorly and posteriorly, but not so much as in *canadensis*. Antennæ exceeding the length of body, subclavate. First dorsal plate wide, angles a little produced, sides one-toothed; posterior border with a row of fine, ciliated spines; anterior row of scales barely distinguishable, middle row of four large scales, posterior of three, small ones in the middle and two larger ones at both ends, anterior side scale small, other one (repugnatorial pore scale) large elongate. Other dorsal plates with the scales distinct, anterior angles rounded, posterior produced, lateral margins 3–4 toothed, posterior border of anterior segments ciliated; anterior border divided by the median dorsal line into two large scales; middle row consists of four scales, posterior of six, outer larger, anterior side scale large and swollen, repugnatorial pore scale large and elongate; scales of last segments more elongate, marked with fine irregular lines, the last row projecting behind. Feet long, strongly crassate in the male and the femur swollen above, in the female somewhat crassate. ♂ copulation foot large, slender and curved; apex beneath with several bunches of flat, spiny hairs, below this are four tubercles, the two lowest ones on the inner side largest, elongate, the last one pointing toward the coxæ, piligerous pulvillus large, above which is a moderately long tapering branch and below a tubercle. Length of body 15–18^{mm}; width, 2.8–3.5^{mm}.

Habitat.—Pensacola, Fla.

I have examined 15 specimens of this species, collected by myself in the vicinity of swamps. This species is related to *canadensis*, but is easily distinguished by the long slender tubercles of the male genitalia.

Genus II.—Chætaspis, gen. nov.

Body slender, not much depressed, more convex that in *Polydesmus*, but not so much as in *Scytonotus*.

Antennæ with the third and sixth joints equal, the latter strongly swollen, second and fifth subequal, fourth equal to seventh and eighth. Segments 20; lateral plates distinct, but not as in *Polydesmus*, slightly angled, serrate; dorsal plates smooth, excepting a row of indistinct, setigerous tubercles along the anterior and posterior margins, no median, dorsal line; last acuminate. Repugnatorial pore rather large, placed on a moderately large and round tubercle, near the outer border of the 5, 7, 9, 10, 12, 13, 15, 16, 17, 18, 19 dorsal plates. Pairs of feet, ♂ 30, ♀ 31.

This genus is related to *Polydesmus* and *Scytonotus*, but can be easily separated by the character of the dorsal plates.

2. Chætaspis albus, sp. nov.

White throughout. Slender, small, slightly acuminate before. Antennæ exceeding the width of body, subclavate. First dorsal plate large, semicircular, angles not produced, provided with five rows of hairs. Other dorsal plates with the posterior angles a little produced, lateral margins with 3–4 setigerous teeth; rows of hairs 2 to 3. Feet rather long, ♂ crassate, ♀ slightly crassate. ♂ copulation foot erect, not as in *Polydesmus*; composed of two pieces, the outer curving outwards and then inwards so that the ends almost touch over the median line of body, rather robust, somewhat flattened, the end apparently divided into three pieces—a small lobe, followed by a long and slender one with the end turned sharply downward, and this by a large flat bifid piece; inner piece narrow and thin, sickle shaped, the end curving up between the branched lobe of the outer piece; coxæ with a few long hairs. Seventh dorsal plate enlarged. Length of body 6–7.5^{mm}; width, 0.3–0.5^{mm}.

Habitat.—Bloomington, Ind.

I have examined four ♀ ♀ and three ♂ ♂. It seems to be more underground in its habits than the other species of this family known to me. I have always found it under logs buried rather deep in the ground. I thought at first this might be the young of some other *Polydesmidæ*, but having found several males and taken a pair in the act of copulation, I have decided that it must belong to a new genus.

Genus III.—Scytonotus Koch.

3. Scytonotus cavernarum, sp. nov.

Allied to *nodulosus* Koch. Pure white throughout. Slender, somewhat depressed, acuminate anteriorly. Antennæ exceeding the width of the body, clavate. First dorsal plate elliptical, angles sharp; scales arranged in five, transverse series, anterior row sharp, setigerous, all

covered with fine granulations. Other dorsal plates with all the lateral sides sharply and deeply four or five toothed, scales arranged in four rows, the posterior row more or less setigerous, on the posterior segments the anterior row is not very distinct. Repugnatorial pore scale large and swollen. Legs moderately long and slender. Length of body 11^{mm}; width, 1.5^{mm}.

Habitat.—Mayfield's Cave, Bloomington, Ind.

This species is described from one female found crawling on the floor of the above cave, in October, 1886. As already stated, this species is more nearly related to *nodulosus*, but as *granulatus* is the only species found so far in the vicinity of Bloomington, I suppose it is descended from *granulatus*.

[From *Entomologica Americana*, III, 1887, pp. 81–83].

NEW NORTH AMERICAN MYRIAPODS.

BY CHARLES H. BOLLMAN.

The types of the following new species are deposited in the Museum of the University of Indiana.

Subgenus *Parajulus*.

1. Parajulus rugosus, sp. nov.

Brown, segments banded with dark gray posteriorly, black dorsal line and lateral row of spots distinct, vertex black, feet banded with brown. Moderately slender, rough, not pilose. Vertex wrinkled, median sulcus plain, setigerous foveolæ present. Eyes distinct, triangular, almost trapezoidal; ocelli 50–55, arranged in 8 or 9 rows. Segments 51–54. Sides of first segment only marginate, other segments moderately striate beneath, with punctations and short lines above. Last segment produced into a sharp, robust spine, projecting beyond the anal valves, which are scarcely marginate, anal scale large, obtuse, very sparsely pilose. Repugnatorial pore large, not touching the transverse suture, which is bent. Pairs of feet 96–104, exceeding the width of body. Male: Mandibulary stipes strongly produced beneath at the anterior angle. Coxæ of the second pair of feet produced as in *impressus*. Genitalia: anterior part of first plateshor ter than posterior part, round, slightly bent outwards, pilose; posterior part flat, angularly spatulate, presenting the broad side outwards; anterior division of posterior plate curving up around in front of anterior, end bifid, slightly margined beneath; posterior part lanceolate, slender, about as long as anterior division. Length of body, ♂ 35^{mm}, width, 2.2^{mm}; ♀ 40^{mm}, width, 3^{mm}.

HABITAT.—Monongahela City, Washington County, Pennsylvania.

In the plan of the male genitalia this species is related to *ellipticus*, but differs greatly from that species especially in the form of the posterior plate.

This species is described from two males and two females, collected by Mr. Albert Gregg.

2. Strongylosoma poeyi, sp. nov.

Dark green, lateral plates and feet pale. Robust, not smooth, shining. Antennæ subclavate, longer than the width of body. First segment rather large, convex, scarcely punctate. Other segment punctate,

transverse suture deep, not tuberculate. Lateral plates thick and obtuse, scarcely produced. Repugnatorial pore situated on the posterior third and slightly beneath, sunken. Male: Genitalia long and slender, somewhat expanded and excavated towards the end, which is bifid. Length of body 27^{mm}; width, 2.3^{mm}.

HABITAT.—Havana, Cuba.

This species is described from one male and one female, both in a rather bad condition. I have named this species after its collector—Dr. Felipe Poey—who also sent me in the same collection *Orphnæus brasiliensis*, *Mecistocephalus guildingii*, *Scolopendra alternans*, and *Newportia longitarsis*.

3. Geophilus salemensis, sp. nov.

Frontal plate present, anal pores moderate. Light red, head, antennæ, last segment and feet orange. Robust, slightly attenuated anteriorly, more strongly posteriorly, moderately smooth, sparsely punctate and pilose. Prehensorial feet punctate and pilose; sternum wider than long (8:6), anterior margin not produced; coxæ scarcely longer than wide (3.5:3), unarmed; one small tooth. Cephalic plate longer than wide (7:5.5), suboval, sparsely punctate and pilose; prebasal plate exposed; basal plate about three times wider than long. Antennæ moderate, joints rather long, two preceding the last not noticeably shortened. Dorsal plates plainly bisulcate; anterior predorsal plates equal to posterior, median longest; ventral plates with a median foveolæ, sparsely punctate. Spiracles round, anterior large, median and posterior small. First pair of feet moderately short and slender, anterior and posterior subequal. Posterior coxæ moderately inflated, pilose, pores few and mostly concealed by the last ventral plate, which is wide, with the sides substraight and rapidly converging. Pairs of feet of male 51–54, last strongly crassate and densely pilose, armed; female 54–56, last slender, armed, and pilose. Length of body, 35–60^{mm}; width, 1–2^{mm}.

HABITAT.—Salem, Indiana.

I have examined five males and four females of this species. It is more related to *Geophilus rubens* Say.

4. Geophilus setiger, sp. nov.

Frontal plate absent; anal pore large, concealed. Orange, head and antennæ brown. Slender, moderately attenuated posteriorly; smooth, sparsely pilose. Prehensorial feet sparsely pilose, smooth, not punctate; sternum wider than long (4:3), anterior margin not produced; coxæ wider than long (2:1.5), unarmed; one single acute tooth. Cephalic plate suboval, longer than wide (4:3.5), smooth, sparsely pilose; basal plate much wider than long (4:1.3), partly covered by cephalic plate. Antennæ short, joints moderate, two preceding last subequal. Dorsal plates distinctly bisulcate; anterior predorsal plates short, median longer than posterior; ventral plates with three longitudinal depres-

sions. Spiracles round, anterior scarcely enlarged, rest nearly equal. First pair of feet short, anterior and posterior subequal, former more robust. Posterior coxæ moderately inflated, pilose, pores few (5–6), arranged along the ventral plate, which is wide with the side straight and strongly converging. Pairs of feet of male 43, last moderately thickened, pilose and armed; female 45, last rather slender, less pilose than male, armed. Length of body 18.5–21.5^{mm}; width, 0.7–1^{mm}.

Habitat.—Salem, Indiana.

I have examined a male and a female.

Subgenus *Archilithobius.*

Lithobius holzingeri, sp. nov.

Chestnut brown, head dark, antennæ and feet paler. Robust, smooth, sparsely pilose; head subrotund, somewhat wider than long. Antennæ moderately long, joints 20–28, long. Ocelli 15–20, arranged in 5 or 6 series. Prosternal teeth 4. Coxal pores 3, 4, 7, 3–5, 6, 1, 5, somewhat traverse, large. Spines of first pair of feet 2, 3, 2; penultimate 3, 3, 2; last 1, 3, 2, 0–1, 3, 3, 6. Posterior pair of feet moderate, in the male the fifth joint is produced on the inner side into a short blunt pilose lobe. Claw of the female genitalia short, wide, tripartite; spines short and stout, subequal. Length of male 16–21^{mm}; female 12–18^{mm}.

Habitat.—Winona, Minnesota.

This species is related to *trilobus*, but is distinguished from it by the greater number of antennal joints, coxal pores, and the larger size. It is described from three males and nine females; I have named it in honor of its collector, Mr. J. M. Holzinger.

[From *Entomologica Americana*, IV, 1888, pp. 1–8.]

A PRELIMINARY LIST OF THE MYRIAPODA OF ARKANSAS, WITH DESCRIPTIONS OF NEW SPECIES.

BY CHARLES H. BOLLMAN.

[Published by permission of John C. Branner, State Geologist of Arkansas.]

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1. Platydesmus lecontei (Wood).

One was found on the grounds of the Deaf Mute Asylum and others on the hills along the river, near Little Rock.

2. Julus minutus (Brandt).

I found a specimen in the swamp at south end of Main street, Little Rock. Mr. Hutcherson also found one near Argenta.

3. Spirobolus marginatus (Say).

Abundant throughout the State.

4. Parajulus cæsius Bollman.

Julus cæsius Wood, Proc. Phila. Acad. Nat. Sci., 43, 1867 (Texas).

This species is not uncommon throughout the State.

5. Cambala annulata (Say).

I have received numerous specimens of this species, collected around Little Rock by Mr. Hutcherson.

6. Lysiopetalum lactarium (Say).

Common throughout the State.

7. Campodes flavicornis Koch.

Campodes flavicornis Koch, Syst. der Myr., 126, 1847 (Pa.).

Campodes fusicornis Koch, Syst. der Myr., 127, 1847 (Pa.).

Spirostrephon cæsioannulatus Wood, Trans. Amer. Philos. Soc., 194, 1865 (Allegheny Co., Pa.); Ryder, Proc. U. S. Nat. Mus., 526, 1880.

Pseudotremia vudii Cope, Proc. Amer. Philos. Soc., 180, 1869 (Montgomery Co., Va.); Ryder, Proc. U. S. Nat. Mus., 527, 1880.

Cryptotrichus cæsioannulatus Packard, Proc. Amer. Philos. Soc., 190, 1883 (Culmana, Ala., or Ocean Springs, Miss.).

A single specimen was obtained at Little Rock. As this species has a number of synonyms, I have thought it best to give its synonomy.

8. Craspedosoma flavidum, sp. nov.

Yellowish brown, feet and antennæ lighter. Robust, segments not constricted, lateral carinæ small, and body strongly resembling that of *Campodes*. Antennæ longer than width of body. Ocelli 12–14, distinct, arranged in a triangular patch and in 5 or 6 series. Dorsal plates rather smooth, setigerous granules small, setæ rather large. Male feet crassate, those of female slender. Length of body 5.8^{mm}; width .7^{mm}.

Habitat.—Okolona.

This species strongly resembles a *Campodes*. In life the individuals are a dusky yellow. This description is based upon a male and female.

9. Craspedosoma carinatum Bollman.

Not common in the Fourche bottoms, south of Little Rock; also found on the grounds of the Deaf Mute Asylum.

10. Leptodesmus hispidipes (Wood).

Abundant everywhere.

Very common throughout the State. All specimens obtained were young, but the shells of many adults were found.

11. Euryurus evides Bollman.

Paradesmus evides Bollman, Ent. Amer., II, 229, 1887 (Winona, Minn.).

Common over the State. Specimens agree with those from Minnesota.

12. Chætaspis albus Bollman.

Chætaspis albus Bollman, Ent. Amer., III, 46, 1887 (Bloomington, Ind.).

One specimen obtained at Little Rock.

13. Polydesmus minor, sp. nov.

Dark shining brown, lighter beneath. Moderately slender, depressed, slightly acuminate anteriorly and posteriorly, smooth, very sparsely pilose (setigerous). Antennæ equal to width of body, subclavate. First dorsal plate wide, angles not or but slightly produced, not toothed, tubercles not distinct, except lateral. Other dorsal plates with posterior angles produced, especially posteriorly; lateral margins 3 or 4 toothed, indistinct posteriorly, tubercles distinct, arranged in two rows of four each, anterior border indistinctly divided into two, posteriorly, the last row of tubercles project beyond border of segments. Legs long, crassate in male. *Male:* Copulation foot very similar to *serratus;* ventral plates produced into a short, pilose lobe anteriorly. Length of body 10–14^{mm}, width 1.5–1.8^{mm}.

Habitat.—Little Rock.

This species is described from a number of specimens found in the low lands south of Little Rock.

14. Polydesmus pinetorum, sp. nov.

Very similar to *P. serratus*, but the general color paler and size smaller. Tuberculation not so distinct, sides of first segment 1 toothed, other

distinctly 3 or 4 toothed. Last row of scales on posterior segments composed of 6 or 8 setæ tipped scales, which project beyond border of segments. Ventral plate of ninth pair of legs not produced as in *serratus*, copulation foot very similar. Length of body, 15 to 18.5^{mm}; width 2.2 to 2.8^{mm}.

Habitat.—Little Rock, Arkadelphia, Okolona, Murfreesboro, and Ultima Thule.

As already indicated, this species is closely related to *serratus*. It is principally separated by its smaller size and form of the ventral plate of ninth pair of legs of male.

This species may only represent a geographical form of *serratus*. It is very abundant throughout the State, and all those collected during the summer were in the larva stages. I am indebted to Mr. Hutcherson for adult specimens.

15. Fontaria virginiensis (Drury).

Abundant at Donaldson, common at Okolona.

Specimens from Arkansas are similar to those from North Carolina, but those from northern parts of Mississippi valley represent geographical species.

At Donaldson the adults were found crawling on the surface of the ground in company with a large number of their young, probably one adult to 500 or 800 young, then (July 11, 1887) about half grown.

This species seems to be more confined to river bottoms and low rich woodlands.

The odor of prussic acid is strongly emitted by this species through a series of pores on each side of the body.

16. Sphæriodesmus pudicus, sp. nov.

General color pinkish, especially posteriorly, anterior half of segments darkest, a black median dorsal line, antennæ dark, legs pale. Body widest and highest anteriorly, tapering posteriorly, smooth, setæ absent. Vertex smooth, somewhat sulcate. Antennæ subclavate, about equaling width of body. Dorsal plates smooth, four preceding the last with an indistinct row of obtuse scales; lateral plates, except the first, antepenult and penult with their posterior margin serrate. Anal plate triangular with the angles rounded, sparsely pilose. Legs long and slender, extending beyond sides of body. Male: Ventral plate of second pair of legs produced into two short cones; coxæ of second and third pairs more pilose than others; copulation foot much twisted, end expanded and divided, pilose. Length of body 7^{mm}; width 2^{mm}.

Habitat.—Little Rock and Okolona.

This is the first time that any species of this genus has been found in the United States. It is easily distinguished from *S. mexicanus* (Saussure), by having a few scales on posterior dorsal plates.

The collection contains two specimens of this species.

17. Polyxenus fasciculatus Say.

Common at Little Rock, five were obtained at Antoine and one at Ultima Thule.

18. Pauropus lubbockii Packard.

A few specimens were obtained at Little Rock.

19. Linotænia bothriopa (Wood).

I have received one specimen that was collected near Little Rock by Mr. Hutcherson.

20. Linotænia robusta (Meinert).

Scolioplanes robustus Meinert, Proc. Amer. Phil. Soc., 224, 1886 (? N. A.)

Frontal plate present. Fulvous, head and antennæ dark. Not robust, attenuated anteriorly and posteriorly; moderately smooth, sparsely pilose. Prehensorial feet smooth, sparsely pilose; sternum sub-cordiform, length and width subequal; coxæ a little wider than long, unarmed; tooth strong, acute; claw small, a little curved. Cephalic plate somewhat wider than long, smooth, sparsely pilose, sides strongly rounded, slightly diverging, posterior margin only covering a small part of basal plate, basal plate two-thirds as long as cephalic, twice as wide as long. Antennæ moderately short, articles short, penult and antepenult not noticeably shortened. Dorsal plate subsmooth, anterior prescuta short, median and posterior long. Spiracles round, very small. Ventral plates with an obsolete median foveola, pores on posterior margin. First pair of legs short, posterior longer than anterior. Posterior coxæ moderately inflated, pores about 12 to 18, small, in three series; last ventral plate triangular, small, sides moderately converging. Posterior pair of legs longer than penult, crassate in the male, slender in the female; claw large. Pairs of legs of male 51–55; of female 54–59. Length of male 27–33^{mm}; of female 34–52^{mm}.

Habitat.—Little Rock, Okolona, Arkadelphia, and Ultima Thule.

I refer this species provisionally to *L. robusta* (Meinert), although it differs from Meinert's description by rather unimportant characters. I have also seen specimens of this species from Tennessee.

21. Linotænia branneri, sp. nov.

Frontal plate present. Fulvous, head and antennæ dark. Robust, strongly attenuated anteriorly, less posteriorly; moderately smooth, sparsely pilose. Prehensorial feet smooth, sparsely pilose; sternum subcordiform, wider than long (5:3); coxæ wider than long, unarmed; tooth strong, acute; claw large, curved. Cephalic plate subquadrangular, sides rounded, slightly diverging posteriorly; basal plate about half as long as cephalic, twice as wide as long, anterior margin scarcely covered by cephalic plate. Antennæ long, joints moderate, penult and antepenult longer than wide. Dorsal plates moderately smooth; anterior and posterior prescuta moderate, median larger. Spiracles round,

moderately large. Ventral plates with a distinct median sulcus; pores on posterior part. First pair of legs moderately short, anterior and posterior subequal. Posterior coxæ strongly inflated, pores large and small, about twelve. Anal legs of the female slender, claw large. Pairs of legs of female 43. Length of female 37mm.

Habitat.—Little Rock.

This species is named in honor of Dr. J. C. Branner, State geologist of Arkansas.

The collection contains one specimen of this species. It is related to *bothriopa*, but is distinguished by a smaller number of legs and its large posterior coxa and pores.

22. Geophilus perforatus (McNeill).

Schendila perforata, McNeill, Proc. U. S. Nat. Mus., 325, 1887, (Pensacola, Fla.)

Abundant throughout the State.

23. Geophilus okolonæ, sp. nov.

Frontal plate absent; anal pores absent. Fulvous, head and antennæ darkest. Rather slender, very slightly attenuated anteriorly and posteriorly, smooth, very sparsely pilose and punctate. Prehensorial feet smooth, punctate, sternum wider than long (4:3.5); coxa of about equal length and width, unarmed; claw moderately curved; teeth almost obsolete. Cephalic plate slightly longer than wide, suboval, posterior margin truncate, sparsely punctate and pilose; prebasal plate exposed; basal plate much wider than long (5:2). Antennæ short, penult and antepenult joints not noticeably shortened. Dorsal plates distinctly bisulcate. Anterior spiracle rather large, oval, oblique, median and posterior smaller. Ventral plate with an indistinct median sulcus; pores not manifest. First pair of legs short, anterior and posterior subequal. Posterior coxa scarcely inflated, pores absent; last ventral plate wide, side moderately converging, not densely pilose. Anal legs produced, armed, rather densely pilose beneath, crassate. Pairs of legs of male 61; of female 63. Length of body 40mm.

Habitat.—Okolona.

There are two adults of this species in the collection. It is separated from other North American species by having no coxal pores and the prebasal plate exposed.

24. Geophilus salemensis Bollman.

I have seen one specimen that was collected near Little Rock by Mr. Hutcherson.

25. Cryptops hyalinus Say.

Cryptops hyalina Say, Journ. Phila. Acad. Nat. Sci., III, 1820 (E. Florida); Say, Oeuvres Ent., sp. 3, 1822; Newport, Trans. Linn. Soc. 409, 1844; Newport, Cat. Myr. Brit. Mus. Chil. 60, 1856; Wood, Trans. Amer. Philos. Soc. 168, 1865; Underwood. Ent. Amer., 65, 1887.

Cryptops hyalinus Koch, Syst. d. Myr., 175, 1847; Gervais, Aptères, IV, 293, 1847.

? *Cryptops milberti* Gervais, Aptères, IV, 592, 1847 (New Jersey).

? *Cryptops milbertii* Wood, Trans. Amer. Philos. Soc., 168, 1865; Underwood, Ent. Amer., 65, 1887.

Cryptops asperipes Wood, Proc. Phil. Acad. Nat. Sci., 129, 1867 (Montgomery County, Va.); McNeill, Proc. U. S. Nat. Museum, 328, 1887 (Pensacola, Fla.); Underwood, Ent. Amer., 65, 1887.

Cryptops sulcatus Meinert, Proc. Amer. Philos. Soc., 211, 1886 (Bee Spring, Ky.); Underwood, Ent. Amer., 65, 1887.

The study of a large series of specimens of the genus *Cryptops* has convinced me that all the species of *Cryptops* described from North America belong to a single species—*hyalinus* Say.

I have questioned the *Cryptops milberti* of Gervais, because the author states that the spines of the last pair of feet are absent. This character is contrary to the true definition of *Cryptops*, and I am inclined to think that either Gervais had an abnormal specimen or that his observations were incorrect.

Asperipes Wood, has been separated from the other species by the number of antennal joints (19), which he assigned to his species, but as the number of joints has recently been found to be variable it is not a true character upon which species can be based.

In Ent. Amer. 65, 1887, Dr. Underwood says the last pair of legs of *sulcatus* Meinert, are unarmed, as in *milberti* Gervais, but in this he is mistaken, for, in his generic description Dr. Meinert states that the last pair of legs are armed with a definite number of spines.

Considering this state of characters, I believe that all the described species should be united under *C. hyalinus*. I have examined specimens of this species from the following States: Maryland, Pennsylvania, Indiana, Tennessee, North Carolina, Florida, Indian Territory, and Arkansas, where it is very common.

26. Theatops spinicaudus (Wood).

Abundant from Little Rock to Ultima Thule.

27. Scolopendra heros Girard.

Two adults were obtained at Little Rock, several young at Murfreesboro and Muddy Fork.

28. Scolopendra woodii Meinert.

A single specimen was caught at Donaldson.

29. Scolopocryptops sexspinosus (Say).

Common at all points; these specimens are of a darker shade than northern or eastern examples.

30. Henicops fulvicornis (Meinert).

A single specimen was obtained at Little Rock near the Deaf Mute Asylum. This is a European species, and the only other recorded North American locality is Mount Lebanon, New York.

31. Lithobius branneri Bollman.

A single specimen was obtained at Okolona and another at Little Rock.

32. Lithobius proridens Bollman.

A few were obtained at Little Rock. One individual is considerably larger than any specimen collected before.

33. Lithobius pinguis, sp. nov.

Posterior angles of all the dorsal plates straight. Anal pair of legs armed with two claws. Coxal pores few, in a single series. Penultimate pair of legs armed with two claws. Coxæ of the posterior feet unarmed. Dark chestnut brown, head and antennæ dark, legs paler. Slender, not smooth, sparsely pilose; head wider than long (3.5:3), polished, not pilose. Antennæ short, 22 to 24 jointed, articles short. Ocelli 4 to 6, arranged in 2 or 3 series. Prosternal teeth 2+2. Coxal pores 3, 3, 3, 2 to 4, 4, 4, 4, round. Spines of the first pair of legs 0, 0,1; penultimate pair 1, 3, 2, 1 to 1, 3, 3, 1; anal pair 1, 3, 2, 0. Posterior legs short. Female: Claw of the genitalia entire, stout and much curved; spines strong, subequal. Length of body 9–10^{mm}.

Habitat.—Little Rock.

This description is based on three specimens. This is the smallest North American species with the claw of the female genitalia entire.

34. Lithobius celer, sp. nov.

Posterior angles of the 9, 11, 13 dorsal plates produced. Anal pair of legs armed with one claw. Coxal pores few, in a single series. Penultimate pair of legs armed with two claws. Coxæ of the 13, 14, 15 pairs of feet laterally armed. Brown of various shades, head and legs more or less chestnut, antennæ dark. Moderately robust, smooth, sparsely pilose; head about as long as wide, pilose. Antennæ rather long, 30 to 34 jointed, articles small. Ocelli 18 to 40, arranged in 4 to 7 series. Prosternal teeth 5 + 5 to 7 + 7. Coxal pores 2, 3, 3, 2 to 5, 6, 6, 5, round. Spines of the first pair of legs 1, 2, 1 to 2, 2, 1; penultimate pair 1, 3, 3, 1 to 1, 3, 3, 2; anal pair 1, 3, 3, 1 to 1, 3, 3, 2. Posterior legs short. Male: Tibia of anal legs somewhat crassate, and furrowed beneath; but more furrowed in the female. Female: Claw of the genitalia short, tripartite, middle lobe much longer, others subequal; spines moderately slender, inner shortest. Length of body 15–25^{mm}.

Abundant or common throughout the State.

This species is not strongly related to any known North American species; it should be placed near *forficatus*, which it seems to replace in Arkansas.

Dr. Wood has reported *forficatus* from Arkansas and he may have had the species which I have described.

35. Lithobius œdipes, sp. nov.

Posterior angles of the 9, 11, 13 dorsal plates produced. Anal pair of legs armed with two claws. Coxal pores few, in a single series. Penultimate pair of legs armed with two claws. Posterior coxæ unarmed. Brown, head and antennæ dark, legs and ventral plates paler. Robust, not smooth, sparsely pilose; head smooth, of about equal length and breadth (3.2: 3.6). Antennæ short, attenuate, 24 to 26 jointed (♂, 26, ♀, 24). Ocelli 9 to 11, arranged in 3 or 4 series. Prosternal teeth 2 + 2 or 3 + 3. Coxal pores 3, 5, 4, 3 to 6, 5, 5, 5 round. Spines of the first pair of legs 1, 1, 1; penultimate pair 1, 3, 3, 2; anal pair 1, 3, 3, 1. Posterior pair of legs short. Male: Femur of the last pair of legs somewhat bent inwardly and swollen; tibia very strongly swollen, especially above, and having a bunch of hairs on the posterior third; first tarsal joint crassate. Penultimate pair of legs somewhat swollen, principally the tibia; first tarsal joint produced into a short lobe on the inner side. Female: Posterior pair of legs scarcely swollen; claw of the genitalia entire; spines 2–2. Length of male 15.4^{mm}; of female 20^{mm}.

Habitat.—Little Rock.

I have three specimens of this species. This is the only known species with both the anal and penultimate pairs of feet swollen or produced into lobes.

36. Lithobius transmarinus Koch.

Abundant at Little Rock, common at other localities.

37. Lithobius mordax Koch.

Common from Little Rock to Ultima Thule.

38. Lithobius vorax Meinert.

Found at all points where collections were made, but was more common at Little Rock.

39. Lithobius multidentatus Newport.

In a vial of Myriapods that were collected near Little Rock by Mr. Hutcherson, there is a single specimen of this species.

40. Scutigera forceps (Rafinesque).

One adult was seen at Arkadelphia, and several young at Little Rock.

INDIANA UNIVERSITY, *March 28, 1888.*

[From *Ann. N. Y. Ac. Sc.* x, 1888, pp. 106–112.]

NOTES UPON A COLLECTION OF MYRIAPODA FROM EAST TENNESSEE, WITH DESCRIPTION OF A NEW GENUS AND SIX NEW SPECIES.

BY CHARLES H. BOLLMAN.

[Read October 3, 1887.]

All the material in this interesting collection represents only two or three hours' collecting by Prof. Branner.

The discovery of a new genus and several new species in so short a time suggests that an unusually large amount of new material would be brought to light by careful collecting through East Tennessee.

Of the six new species described, one is from the vicinity of Knoxville (also found at the other localities), one from Mossy Creek, and four from Beaver Creek, Jefferson County.

The new genus is from the latter place.

The types of the new species belong to the Museum of the University of Indiana, and are there deposited.

A.—KNOXVILLE, KNOX COUNTY.

All the specimens from this locality were collected on May 21, 1887, in the woods about one mile south of the river at Knoxville, near the Maryville road.

1. Parajulus pennsylvanicus (Brandt).

Three females were obtained.

2. Lysiopetalum lactarium (Say).

Lysiopetalum eudasum McNeill, Proc. U. S. Nat. Mus., 330, 1887 (Bloomington, Ind.).

The collection contains one female, which agrees in all respects with the types of *eudasum*.

3. Chætaspis albus Bollman.

Chætaspis albus Bollman, Ent. Amer., III, 46, 1887 (Bloomington, Indiana).

I can find no difference between the types of this species and the single female obtained.

4. Polydesmus canadensis Newport.

The collection contains three females, which I refer to this species, until males can be obtained.

5. Fontaria sp.

I place here two young females, which I cannot identify with any of the known species of *Fontaria.*

6. Geophilus umbraticus (McNeill).

Very common. These specimens differ very slightly from the types in the Museum of the Indiana University.

7. Scolioplanes ruber Bollman.

One specimen obtained.

8. Scolopocryptops nigridius McNeill.

Only one specimen obtained.

9. Cryptops hyalinus Say.

A few small individuals were found.

10. Lithobius branneri, sp. nov.

Subgenus *Archilithobius.*

Light chestnut brown or orange, head and antennæ scarcely darker, feet orange. Slender, smooth, very sparsely pilose; head rounded-triangular, narrowest before. Antennæ short, joints 20, short. Ocelli 6—8, arranged in four or five rows. Prosternal teeth 4, small. Coxal pores 2, 3, 3, 2—3, 4, 4, 3, small and round. First pair of feet armed with 0, 2, 1 spines; penultimate with 1, 3, 1, 1—1, 3, 2, 1; last with 1, 3, 1, 0; in the male its fifth joint is produced into a short pilose lobe, and is depressed. Claw of the female genitalia short, wide, bi- or tri-partite; spines slender, subequal, outer strongly toothed. Length of body, 5–10^{mm}.

Four males and three females were obtained. This species is dedicated to Prof. John C. Branner, by whom the collection was made.

11. Lithobius proridens Bollman.

A single specimen was obtained.

B.—Beaver Creek, Jefferson County.

These species were taken in open cedar thickets from May 21 to 26, 1887.

1. Androgna thus corticarius Cope.

Androgna thus corticarius Cope, Proc. Amer. Philos. Soc. 181, 1869 (Virginia).

Fifteen specimens of this species were obtained. They agree in most respects with Dr. Cope's description, but this genus will not form the

new family *Androgna thidæ*, which he has set up for its reception. This genus belongs to the subfamily *Dolistenia*, and will somewhat modify the character of that group as given by Dr. Latzel.

2. Lysiopetalum eudasum McNeill.

3. Striaria granulosa, gen. et sp. nov. (*Chordeumidæ*).

STRIARIA.

Body cylindrical, strongly resembling a *Lysiopetalum*. Dorsal plates, excepting the last, with 12 strong carinæ, 6 on each side of the median line; between these there are 1–4 rows of round granular dots. First dorsal segment large, advanced forward and covering part of the ocelli. The carinæ are apparently of the same number as the others, while the granular dots are more numerous. Last segment produced into a broad lobe, while the spines are short and wide, thus making the last segment appear as if incised. Ocelli present. Feet short and thick.

To the above generic characters may be added the following specific: Gray-brown first dorsal segment and feet pale. Robust, very slightly depressed, everywhere slightly granulated; body, with the exception of a setigerous granular dot between the first and second rows of carinæ, not pilose; feet sparsely pilose. Ocelli present. Repugnatorial pore not discernible. Feet granulated, 44 were counted. Length of body, 12^{mm}; width, 1.5^{mm}.

The above descriptions were taken from a single female, which is curled in a spire, so that nothing of the head can be seen except a few ocelli. The pairs of feet were counted with uncertainty, some being probably hidden by the first dorsal segment.

This new genus may be distinguished from all previously known by the characters of the dorsal segments.

4. Campodes flavicornis Koch.

Seven specimens were obtained, which agree with the more Northern examples.

5. Craspedosoma carinatum, sp. nov.

Brown, feet pale, antennæ dark, the joints tipped with white. Body rather slender, depressed, somewhat attenuated. Antennæ about one-half times as wide as body, subclavate. Ocelli distinct, triangular, 16, arranged in 4 rows. Dorsal plates with numerous short carinæ, lateral plates distinct. Length of body, 6^{mm}; width, .5^{mm}.

This species is described from a male and a female not quite full grown.

6. Euryurus erythropygus (Brandt).

Common.

7. Geophilus umbraticus McNeill.

Very common.

8. Geophilus perforatus (McNeill).

Schendyla perforata McNeill, Proc. U. S. Nat. Mus., 325, 1887 (Pensacola, Fla.).

Two specimens were obtained.

9. Scolioplanes bothriopus (Wood).

Only one specimen.

10. Scolioplanes ruber Bollman.

11. Scolioplanes gracilis, sp. nov.

Frontal plate present. Orange, head and antennæ brownish. Slender, strongly attenuate anteriorly, less so posteriorly; smooth, sparsely pilose, feet more densely. Prehensorial feet sparsely pilose; sternum subcordiform, wider than long (5: 2. 3); coxa twice as wide as long, unarmed; last joint unarmed; claw moderately curved, excavated beneath, as long as the head is wide. Cephalic plate subquadrate, of almost equal length and width, posterior margin concealed by basal plate; prebasal plate concealed; basal plate four times as wide as long (4.5: 1.2). First pair of feet short, anterior and posterior subequal. Posterior coxa rather strongly inflated, pilose; pores few, large and small, placed in two irregular rows along the ventral plate, which is very wide, sides rapidly converging and substraight. Last pair of feet of male rather slender, armed; of female somewhat more slender and armed. Pairs of feet of ♂, 80; of ♀, 83. Length of body ♂, 34.5mm, width, 0.5mm; ♀, 53.5mm, width, 1.4mm.

This species ought to form a new genus, but having only an adult female and a young male, I have not been able to examine the mouth-parts.

It differs from *Scolioplanes* in the characters of the cephalic plate, prehensorial feet, and the last ventral plate and pair of feet.

12. Scolopocryptops sexspinosus (Say).

Specimens from this locality, as well as those from more Southern ones, differ in some important details from the Northern specimens, principally in having the last pair of legs more slender and the last ventral plate narrower; but these characters do not seem to warrant the formation of a different species.

13. Scolopocryptops nigridius McNeill.

14. Theatops crassipes (Meinert).

Two specimens obtained, which agree with specimens from Florida.

15. Cryptops hyalinus Say.

16. Lithobius Branneri Bollman.

Four specimens were found here,

17. Lithobius cæcus, sp. nov.

Subgenus *Archilithobius*.

Orange, head and last segments dark, feet and antennæ scarcely paler. Rather slender, smooth, sparsely pilose; head subrotund, longer than wide. Antennæ rather long, joints 31, short. *No trace of ocelli*, but darker colored in the place where they ought to be. Prosternal teeth 4. Coxal pores 2, 3, 4, 3, round. Spines of the first pair of feet, 2, 2, 1; penultimate, 1, 3, 2, 0; last, 1, 3, 1, 0. Last pair of feet moderately long. Claw of the female genitalia long, bilobed; spines slender, inner shortest. Length of body, 10^{mm}.

18. Lithobius lundi Meinert.

Two specimens obtained.

19. Lithobius proridens Bollman.

20. Lithobius cantabrigensis Meinert.

21. Lithobius multidentatus Newport.

Two specimens obtained.

C.—MOSSY CREEK, JEFFERSON COUNTY.

The species from this locality were taken in the woods half a mile northwest of the railway station, May 22, 1887.

1. Parajulus pennsylvanicus (Brandt).

2. Geophilus umbraticus (McNeill).

3. Scolopocryptops nigridius McNeill.

4. Cryptops hyalinus Say

5. Lithobius branneri Bollman.

Two specimens obtained.

6. Lithobius similis, sp. nov.

Subgenus *Archilithobius*.

Brown, head and last segment orange; antennæ dark, feet somewhat paler. Moderately robust, rough, sparsely pilose; head subrotund, length and width subequal. Antennæ short, joints 21, short. Ocelli 16, arranged in 6 rows. Prosternal teeth, 4. Coxal pores, 4, 5, 5, 5, large and round. Spines of the first pair of feet, 1, 2, 1; penultimate, 1, 3, 3, 1; last, 1, 3, 1, 0. Posterior feet moderately long. Claw of the female genitalia moderately short, wide, tripartite, lobes short; spine short and stout. Length of body, 11^{mm}.

This species is described from one female; it is related to *pullus*, but differs from the latter in the characters of antennæ and the claw of female genitalia.

7. Lithobius proridens Bollman.

UNIVERSITY OF INDIANA,
Entomological Laboratory, June 8, 1887.

[From *Proc. U. S. Nat. Mus.*, XI, 1888, pp. 335–338.]

NOTES ON A COLLECTION OF MYRIAPODA FROM CUBA.

BY CHARLES H. BOLLMAN.

This paper is based on a small but interesting collection of myriapods that I have received from Prof. Felipe Poey, of Havana, Cuba.

As Prof. Poey did not mention any particular locality in the island of Cuba, I suppose that most of the species are from the vicinity of Havana.

I desire to tender my thanks to Prof. Poey for the material I have received from his hands, and to Dr. Juan Gundlach for a specimen of a *Sentigera*.

The types of the new species have been deposited in the U. S. National Museum.

1. Siphonophora portoricensis Brandt.

Siphonophora portoricensis Brandt, Bull. Acad. St. Petersb., 1836 (*name only, teste Gervais*); Brandt, Recueil, 50, 1841 (*name only, teste Gervais*); Koch, Syst. Myr., 143, 1847 (*name only*); Gervais, Aptères, 209, 1847 (*name only*); Peters, Monatsber. kön. preuss. Akad. Wiss. Berlin, 549, 1864 (*first description*); Karsch, Ann. Soc. Ent. Belgique, 166, 1884.

Siphonophora cubana Karsch, Mittheil. Münch. Ent. Ver., 144, 1880; Borre, Ann. Soc. Ent. Belgique, 81,1884.

I have received from Prof. Poey a dried *Siphonophora*, which I have been unable to separate from either *Siph. portoricensis* Brandt, or *Siph. cubana* Karsch.

Concerning the differences between these two species, Karsch, under his description of *Siph. cubana*, says:

"*An eadem species cum Siph. portoricensis* Br., *qua tamen capite basi latiore, rostro multo breviore et præcipue longitudine multo minore satis differre videtur?*"

As such differences are practically valueless, it is best to consider *Siph. portoricensis* and *cubana* as forming one species.

2. Nannolene cubensis, sp. nov.

Diagnosis.—Related to *Nannolene burkei* Bollman, but the circular depressions along the transverse segmental sutures not extending all around the segment as in *burkei*, but only to the repugnatorial pore.

The following differences are also worthy of note:

Dark brownish-blue, posterior border of segments brown, an indistinct row of lateral spots, antennæ and legs light-brown. Ocelli dis-

tinct, about 16, arranged in 3 transverse series. Segments 47. Antennæ and legs stouter.

The above notes are based on a dried female, which was afterwards soaked in alcohol. As this is the first record of a species of this genus from Cuba, I have given it the specific name of *cubensis*.

3. Paradesmus poeyi Bollman. *Strongylosoma poeyi* Bollman, Ent. Amer., 82, 1887 (*Cuba*).

Abundant.

Through a misunderstanding of the description of *Paradesmus* I placed this species in *Strongylosoma*, and did not discover my mistake until after the description of the above species had been published.

This species should now be placed in the genus *Paradesmus*. It is very closely related to, if not identical with, *P. vicarius* Karsch, from Mayotti and Anjaani.

The copulation foot of the males of *poeyi* differs from that of *vicarius*, as figured by Karsch, in having the femoral part twice as long as the tibial, and the lower lobe of the tibial part is wide and thin, with a distinct median thickening, not cylindrical as in *vicarius*.

4. Leptodesmus couloni. *Polydesmus* (*Oxyurus*) *couloni* Humbert & Saussure, Myr. Nov. amer., 3, 1869 (*Cuba*).

Among the material sent by Poey is a dried female, which agrees perfectly with the descriptions of the above species.

5. Stenonia maculata, sp. nov.

Diagnosis.—Related to *Stenonia fimbriata* (Peters), but at once separated by the tuberculation of the dorsal plates, by the crenulation of lateral carinæ, by the character of anal segment and the pattern of coloration.

The following is a careful description of the species: Rosy, especially the tubercles; nearly all the repugnatorial pore bearing segments with a deep blotch on each side above the carinæ; antennæ dark, legs pale. Body wide, convex, not attenuated anteriorly, slightly posteriorly. Antennæ short, subclavate. First segment very wide, completely concealing the head as in *fimbriatus;* a row of small scales along the posterior margin; two large median scales; along anterior margin a row of twelve rectangular scales, between the third and fourth from posterior angle a distinct notch, between the others a slight waviness. Other segments with three distinct rows of scales with smaller ones interspersed; lateral carinæ crenulate the first six, the eighth, eleventh, and fourteenth, with two crenulations, the rest with three; a distinct median dorsal line. Anal segment with six tubercles along posterior margin; preanal scale obtuse, with two long, slender spines.

Length, ♂ 9^{mm}, ♀ 12.5^{mm}; width, ♂ 2.2^{mm}, ♀ 2.8^{mm}.

This new species belongs to the subgenus *Stenonia* (=*Platyrhacus*).

Among the material sent by Prof. Poey is a dried male and female of this species.

6. Rhacophorus magnus, sp. nov.

Diagnosis.—Related to *R. marantus* (Karsch), but with an indistinct row of tubercles along anterior and posterior margins of segments, and a few on lateral carinæ.

Description of species.—Brown, legs light chestnut; robust, wide and depressed, slightly attenuated anteriorly. Segments with a transverse sulcus as in *marantus;* tubercles indistinct, arranged in a more or less irregular row along the margins, three or four large scales on lateral carinæ; lateral carinæ large, strongly margined, anterior angles rounded, posterior much produced. Repugnatorial pore large, subapical, marginal. Length of last *fourteen* segments 22.5mm, width of seventh segment 4.3mm.

The type of this species is a mutilated female, of which the head and first six segments are lost. On account of this I have been unable to determine the subgenus unless it belongs to the same as *marantus.* Karsch has described two other species of this genus from Cuba, but both belong to the subgenus *Cryptodesmus* and lack the transverse dorsal sulcus. This is the largest *Rhacophorus* known.

7. Orphnæus brasiliensis Meinert.

The collection contains a fine female, which agrees very well with Dr. Meinert's description of this species. This is the first record of this species from the West Indies.

8. Mecistocephalus punctifrons Newport.

There are a few specimens in the collection which I refer to this species, agreeing with Dr. Meinert in considering *M. guildingii* a doubtful species and identical with *M. punctifrons.*

9. Scolopendra alternans Leach.

One female of this species sent by Professor Poey.

10. Newportia longitarsis Newport.

Scolopocryptops longitarsis Newport, Linn. Trans., 407, pl. 40, fig. 10, 1844 (*St. Vincent*).

Newportia longitarsis Gervais, Aptères, iv, 298, 1847; Newport, Cat. Myr. Brit. Mus., 57, 1856.

Rufous, head and posterior border of segments darkest, antennæ and legs pale. Moderately robust, smooth, sparsely punctate. Head suboval, sparsely punctate and pilose, not margined, posterior half with two longitudinal sulci. Antennæ short, attenuate, 17 jointed, basal joints crassate, all except the first two hirsute. Prosternum not prominent, callose, sinuate. Anal legs very long and slender, somewhat depressed, femora armed with about 22 large and small hooked spines which are arranged in four or five series, tibia with two long spines beneath, femora and tibia with numerous hooked hairs on the inside. Penultimate pair of legs with the tibia and first tarsal joint also furnished with numerous hooked hairs.

Dorsal plates with six sulci, the median straight or slightly curved inwards, the others outwards. Posterior pleuræ scabrous; pores numerous, small; terminal spine large and robust. Last ventral plate moderately wide, sides converging, posterior border sinuate. Length 28^{mm}, width 3^{mm}.

In the collection are two specimens which I refer to this species. Both have lost most of their legs, especially the anal, of which only one remains and even it is in a mutilated condition so that the tarsal joints can not be counted.

11. Scutigera sp. ?

I have received from Poey and Gundlach several specimens of a *Scutigera*, which I have been unable to identify satisfactorily with any of the known species.

INDIANA UNIVERSITY,
Bloomington, Ind., June 1, 1888.

[From *Proc. U. S. Nat. Mus.*, XI, 1888, pp. 339–342.]

NOTES ON A COLLECTION OF MYRIAPODA FROM MOSSY CREEK TENN., WITH A DESCRIPTION OF A NEW SPECIES.

BY CHARLES H. BOLLMAN.

The following list of myriapods is based upon an extensive collection made at various times by Mr. Charles B. Branner, of Mossy Creek, Tenn. As the material was collected in all seasons of the year, and a large number of species found, it is safe to say that this list is almost complete.

Notes on a small collection made at Mossy Creek and other places in East Tennessee, by Dr. John C. Branner, were published in the Ann. N. Y. Acad. Nat. Sci. for 1887; but in this list there are no species mentioned as occurring at Mossy Creek which have not been found by Mr. Charles B. Branner.

I here desire to express my sincere thanks to Mr. Charles B. Branner for the numerous specimens he has so kindly sent me.

1. Andrognathus corticarius Cope.

Common. The number of segments vary from 55–65 in the adult specimens. The fifth and sixth antennal joints are not united as Cope has stated, but are distinctly separate, the sixth being the largest joint.

2. Nemasoma minutum (Brandt).

In one lot of material sent were six specimens of this species.

3. Parajulus pennsylvanicus (Brandt).

Abundant.

4. Cambala annulata (Say).

Abundant. All the specimens of this species which I have received from East Tennessee and North Carolina (Balsam and Chapel Hill) are very large (45–52^{mm}), and of a very dark-brown shade, while those which I have examined from other localities (Indiana and Arkansas) are much smaller (26–38^{mm}) and of a light yellowish-brown shade. Specimens from the latter localities may represent a geographical species, but it is hard to say what form Say described, although his description may apply to the former, as his specimens were from Georgia and Florida.

5. Lysiopetalum lactarium (Say).

Very common.

6. Striaria granulosa Bollman.

One female of this species was found in the collection.

This specimen is curled in the same manner as the type specimen, and no more important characters can be ascertained until one of the specimens is torn to pieces.

7. Campodes flavicornis Koch.

This seems to be a rare species in this locality.

8. Fontaria evides Bollman.

No others besides the two type specimens of this species were found.

9. Fontaria tennesseensis, sp. nov.

Diagnosis.—Related to *Fontaria castanea* (McNeill), but the lateral carinæ larger, and the copulation foot of male different.

Type.—U. S. Nat. Museum; No. 203, Mus. Ind. Univ.; No. 388, author's coll.

Description.—Brown, lateral carinæ pink; an indistinct dark median dorsal line; legs and underparts yellow. Body depressed; anterior segments of female noticeably attenuated; segments smooth, marked with numerous short lines; papillæ prominent, especially on lateral carinæ. Vertex sulcus moderate; occipital, antennal, and clypeal fovel olæ single. Lateral carinæ large, moderately produced; repugnatoria-pores large and placed on the upper edge of the posterior third of the carinæ. Ventral plates produced into a short, straight cone; coxæ unarmed. Male: Segments more depressed than in the female, antennæ more crassate. Copulation foot deeply bifid; the inner or shorter branch cylindrical, tapering, twisted at base; outer or seminal branch somewhat flattened and wavy, end slightly expanded. Length, 23–27^{mm}; width, 5–7^{mm}.

Tennesseensis is very closely related to *castanea* in all points except the copulation foot and lateral carinæ. From *oblonga* it is separated by not having the posterior border of segments red (white, acc. to Koch, but this is probably due to immersion in alcohol). No. 388 contains five specimens, two males and three females, of which two have been deposited in the U. S. National Museum. No. 203, Mus. Ind. Univ., contains a female of this species.

10. Euryurus erythropygus (Brandt).

Common.

11. Scytonotus setiger (Wood).

There are ten specimens of this species in the collection.

12. Polydesmus branneri Bollman.

Not common.

13. Linotænia ruber Bollman.

Not common.

14. Linotænia bidens (Wood).

One specimen of this species obtained.

15. Linotænia robusta (Meinert).

Common.

16. Linotænia fulva (Sager).

Strigamia fulva Sager, Proc. Phila. Acad. Nat Sci., 1856.
Strigamia bothriopa Wood, Journ. Phila. Acad. Nat. Sci., 1861.

Not common.

17. Scolioplanes gracilis Bollman.

Although this species belongs to a new genus, I do not care here to erect a genus for its reception. I prefer to wait until I can obtain more specimens in order to satisfactorily make an examination of the mouth parts.

18. Geophilus varians McNeill.

One specimen, ♀, pairs of legs 57.

19. Geophilus umbraticus (McNeill).

Abundant.

20. Scolopocryptops sexspinosus (Say).

Common.

21. Scolopocryptops nigridius McNeill.

Common.

22. Theatops posticus (Say).

Not common.

23. Theatops spinicaudus (Wood.)

Common.

24. Cryptops hyalinus (Say).

Abundant.

25. Scolopendra woodi Meinert.

One specimon in the collection.

26. Lithobius proridens Bollman.

Not common.

27. Lithobius trilobus Bollman.

Lithobius similis Bollman, Ann. N. Y. Acad. Nat. Sci., 112, 1887 (*Mossy Cr., Tenn.*).

I now consider *similis* as identical with *trilobus*. Only the type specimen of *similis* was obtained.

28. Lithobius lundi Meinert.

Not common.

29. Lithobius branneri Bollman.

Common.

30. Lithobius cantabrigensis Meinert.

Rare.

31. Lithobius juventus Bollman.

Not common.

32. Lithobius multidentatus Newport.

Common. Some of the specimens have the coxæ of the anal legs armed laterally with two spines.

INDIANA UNIVERSITY, *October 20, 1888.*

[From *Proc. U. S. Nat. Mus.*, XI, 1888, p.316.]

DESCRIPTION OF A NEW SPECIES OF INSECT, FONTARIA PULCHELLA, FROM STRAWBERRY PLAINS, JEFFERSON COUNTY, TENNESSEE.

BY CHARLES H. BOLLMAN.

Fontaria pulchella, sp. nov.

Diagnosis.—Related to *F. oblonga** Koch, but the lateral carinæ smaller, and produced into a sharp point posteriorly; repugnatorial pore subinferior; ventral spine large, cylindrical, tapering, curved outwards.

Type.—U. S. Nat. Mus.; No. 404, Author's coll.

Description.—Brown, lateral carinæ and posterior border of segments red; legs and under parts yellow. Body very robust, anterior segment scarcely attenuated; smooth, with numerous short lines, as in *castanea* and *tennesseensis;* papillæ less prominent. Vertex sulcus distinct; foveolæ single. Lateral carinæ small, margins swollen and produced posteriorly into a sharp point. Repugnatorial pore large, subinferior, subapical. Ventral plate armed; coxæ unarmed. Length, 20^{mm}; width, 4.3^{mm}; height, 4.2^{mm}.

Dr. Koch's figure of *Fontaria oblonga* represents a species which is more depressed, lateral carinæ larger, and the repugnatorial pores not subinferior, but on the upper side as in *castanea* or *tennesseensis*.

The white with which he says the lateral carinæ and posterior border of segments are colored is probably red, faded by bad alcohol.

This species is described from two females collected at Strawberry Plains by Mr. Charles B. Branner, of Mossy Creek, Tennessee.

INDIANA UNIVERSITY, *November* 1, 1888.

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* *Fontaria oblonga* Koch, Syst. Myr., 142, 1847 (Pennsylvania).

[From *Proc. U. S. Nat. Mus.*, XI, 1888, pp. 343-350.]

NOTES UPON SOME MYRIAPODS BELONGING TO THE U. S. NATIONAL MUSEUM.

BY CHARLES H. BOLLMAN.

Through the kindness of Dr. Charles V. Riley, I have received for examination the unidentified lot of myriapoda contained in the collection of the U. S. National Museum.

This lot contains both foreign and domestic species, but in this paper I have only given notes upon the forms found in the United States.

In addition, I have included several notes upon some material sent to me by Prof. L. M. Underwood, of Syracuse, N. Y.

These specimens originally belonged to a collection, the remainder of which he had presented to the Museum, and has been sent to me among the material received from Dr. Riley.

I desire to tender my thanks to Dr. C. V. Riley, Mr. J. B. Smith, and to Prof. L. M. Underwood for various favors.

1. **Polyzonium rosalbum** (Cope). Marquette, Mich.; E. A. Schwarz.

This specimen, a female, differs from any I have seen in having the general coloration more intensified. Dorsal plates reddish brown, paler posteriorly and along margins; antennæ almost black; face and legs mottled with a purplish shade.

2. **Platydesmus lecontei** (Wood). Acc. 19542, 9, Tallulah, Ga.; L. M. Underwood. Segments 39–49.

3. **Spirobolus hebes** (Bollman). Acc. 14530, San Diego, Cal. Segments 47, ♀.

4. **Spirobolus marginatus** (Say). (?) Virginia, Kuehling. Acc. 19542, 13, Tallulah, Ga.; L. M. Underwood. Acc. 19542, 12, Macon, Ga.; L. M. Underwood. Segments of males 53–55, segments of females 52–57.

5. **Spirobolus spinigerus** (Wood). Acc. 19343, Cape Romano, Fla.; F. B. Meek. Segments of female, 47–49.

6. **Spirostreptus montezumæ** (Saussure). El Paso, Tex.; Potts.

The specimen before me seems to agree in all respects with the descriptions of *S. montezumæ*, which has only been found in the provinces of Vera Cruz and Orizaba, Mexico. This is the first record of any species of this genus from the United States.

7. Parajulus canadensis (Newport). Luray, Va.; L. M. Underwood.

These specimens agree in all respects with the females of *canadensis*, but a male might show some secondary sexual differences. Segments 48–53. Last segment only completely mucronate in about half the specimens.

8. Parajulus venustus (Wood). West Cliff, Colo.; T. D. A. Cockerell.

9. Parajulus impressus (Say). Acc. 19542, 7, Tallulah, Ga.; L. M. Underwood. Acc. 19542, 17, Indian Springs, Ga.; L. M. Underwood. Segments 55.

10. Parajulus pennsylvanicus (Brandt). Luray, Va.; L. M. Underwood. Acc. 19542, 8, Macon, Ga.; L. M. Underwood.

11. Lysiopetalum lactarium (Say). Acc. 19542, 16, Indian Springs, Ga.; L. M. Underwood.

12. Campodes flavicornis (Koch). Washington, D. C.; J. B. Smith.

13. Leptodesmus varius (McNeill). Macon, Ga.; L. M. Underwood.

I have received from Professor Underwood a young female which agrees in all essential points with the types of *varius* from Pensacola, Fla.

14. Fontaria crassicutis (Wood). Acc. 19542, 2, Indian Springs, Ga.; L. M. Underwood. ♂.

Ventral plate and coxæ unarmed; that part of ventral plate which lies between the two pairs of legs of 11–16th segments produced into a conical lobe; legs densely but shortly pilose; color brown, lateral carinæ and under parts yellow. Length, 70mm; width, 15mm.

15. Fontaria georgiana, sp. nov.

Diagnosis.—Probably related to *F. virginiensis*, but the ventral plates and coxæ sharply spined; the upper branch of genitalia bifid.

Habitat.—Lookout Mountain, Tallulah and Macon, Ga.; L. M. Underwood.

Type.—Acc's 19542, 4, 6, 10, 11, 20; U. S. Nat. Museum.

Description.—Dull brown, lateral carinæ; a median dorsal row of spots and underparts yellow. Segments considerably wrinkled. Vertex sulcus shallow, occipital foveolæ 2+2, antennal and clypeal single. Lateral carinæ large, interlocking, posterior angles scarcely produced. Repugnatorial pore large, placed on the upper side of margin near the middle. Ventral spines sharp; coxæ spined. ♂: Segments more depressed than in the female, and antennæ more crassate. Coxæ of copulation foot pilose and armed above with a large, straight spine, as in *F. virginiensis*. Distal halves of copulation foot curving away from each other, but the ends come together and interlock; bifid, the lower branch cylindrical, tapering and slightly curved upwards, the upper branch bifid, the seminal branch of which is flattened, the other is a cylindrical hooked spine. Length, 28–35mm.

This species shows relationship to *F. virginiensis* by the coxæ of copulation foot being provided with a long, straight spine. It also agrees with the more eastern specimens of *F. virginiensis* by having the ventral plates and coxæ spined. *F. georgiana* is described from numerous specimens from Macon, a few from Tallulah, and one from Lookout Mountain.

16. Fontaria tallulah, sp. nov.

Diagnosis.—Ventral plates and coxæ spined as in *F. georgiana*, but separated from that species by having the lateral carinæ and posterior margin of dorsal plates red; posterior angle of lateral carinæ rather sharply produced.

Habitat.—Tallulah, Ga.; L. M. Underwood.

Type.—Acc. 19542, 20; U. S. Nat. Museum.

Description.—Brownish black, lateral carinæ and posterior border of each segment red; antennæ, legs, and underparts yellow. Segments depressed, anterior segment moderately attenuated; corrugated, especially posteriorly and on lateral carinæ; papillæ distinct; vertex sulcus distinct; occipital foveolæ 2+2, antennal and clypeal single (1+1). Lateral carinæ large, interlocking, posterior angle rather sharply produced. Repugnatorial pores large, placed on the upper margin of posterior third. Ventral spines straight, stout, and conical, coxæ armed. Length, 25^{mm}.

F. tallulah seems to be only related to *F. georgiana* by having the ventral plates and coxæ spined. In the pattern of coloration it approaches *F. rubromarginata*, but that species has the ventral plates unarmed and therefore belongs to the same section as *F. corrugata*, *evides*, etc. This species is described from an apparently adult female.

17. Fontaria rileyi, sp. nov.

Diagnosis.—Brown, lateral carinæ red; ventral plate and coxæ unarmed; copulation foot stout, flattened, end subsimilar to a bird's head.

Type.—Acc. 19542, 5, U. S. Nat. Museum.

Habitat.—Macon, Ga.; L. M. Underwood, ♂.

Description.—Brown, lateral carinæ red; antennæ, legs, and under parts yellow. Segments moderately depressed, scarcely attenuated anteriorly; very corrugated, papillæ not prominent; behind each pore an indistinct black swelling. Vertex sulcus shallow; occipital, antennal, and clypeal foveolæ single. Lateral carinæ large, interlocking, posterior angle not much produced. Repugnatorial pores large, placed on the posterior third of margin. Ventral plate unarmed; coxæ not or very slightly armed; femora strongly armed; claws normal. Male: Copulation foot stout, flattened, curved, end subsimilar to a bird's head. Length, 43.5^{mm}; width, 10.2^{mm}.

This species belongs to the same group as *F. corrugata*, *evides*, etc., and should stand near the latter, as shown by the form of the copulation foot. It is separated from *F. evides* by having the copulation foot

more flattened, especially the end, which is cylindrical in *erides;* besides *F. rileyi* attains a larger size.

This species is described from a male specimen.

I take great pleasure in dedicating this species to Dr. C. V. Riley, United States Entomologist, to whom I am indebted for numerous favors.

18. Euryurus erythropygus australis, subsp. nov.

Diagnosis.—Similar to *E. erythropygus*, but the lateral carinæ larger, the margin less swollen, more straight, and the denticules larger. Upper branch of copulation foot five times as long as the lower. Body slenderer.

Type.—Acc. 19542, 18, Indian Springs, Ga.; L. M. Underwood, ♂.

When compared with *E. erythropygus* this new geographical species plainly differs from it by the characters given. The lateral margin of carinæ are also slightly crenulate and the anterior is somewhat serrate. Length, 28^{mm}; width, 3.4^{mm}.

The exceedingly long branch of the copulation foot at once separates *australis* from the true *erythropygus*. The inner tooth is also absent, but this is subject to slight variations in *erythropygus*.

The above notes are taken from a male which is slightly broken.

19. Polydesmus branneri Bollman. Acc. 19542, 23, Tallulah, Ga.; L. M. Underwood.

These specimens are all females, and I refer them to this species with some doubt, but as they are from the region in which *P. branneri* is found they must belong to that species and not to *P. serratus*, which is not quite so southern in its range.

20. Polydesmus serratus Say. Marksville and Natural Bridge, Va.; L. M. Underwood.

21. Linotænia chionophila Wood. ? No. 89, U. S. Nat. Mus., Washington, D. C.; J. B. Smith.

Pairs of legs of female 37–41.

22. Linotænia fulva Sager. Acc. 19542, 15, Indian Springs, Ga.; L. M. Underwood.

Pairs of legs of male 51.

23. Linotænia parviceps Wood. Acc. 17414, Baird, Shasta County, Cal.; L. M. Green.

Pairs of legs of male 79.

24. Geophilus foveatus McNeill. Lookout Mountain; L. M. Underwood.

Pairs of legs of female 43; pleural pores less numerous than in the northern specimens.

25. Geophilus umbraticus McNeill. West Cliff, Colo.; T. D. A. Cockerell.

Pairs of legs of female 49–51.

26. Geophilus virginiensis, sp. nov.

Diagnosis.—Related to *G. mordax*, but on the anterior ventral plates,

especially the 7–13th, an ovate depressed poriferous area along the anterior margin, into which projects a conical elongation of the preceding segment; coxæ of prehensorial legs of about equal length and breadth.

Habitat.—Natural Bridge, Va.; L. M. Underwood.

Type.—U. S. Nat. Museum.

As is indicated by the above diagnosis, this new species is closely related to *G. mordax.*

My specimen is a male, and as *G. mordax* is described from a female the following secondary differences are worthy of notice:

Anal legs moderately crassate, densely and shortly pilose; claw large; pairs of legs 49; length 35mm.

If the characters given in this diagnosis are those peculiar to a male, this new species must be identical with *mordax,* but the proportions of the coxæ of prehensorial legs seem to convince me that they are not markings peculiar to a male.

27. Geophilus smithi, sp. nov.

Diagnosis.—Related to *G. huronicus,* but the coxal pores more numerous, 25–30; coxæ of prehensorial legs of about equal length and width; pairs of legs of female 49; length 20–28mm.

Habitat.—Washington, D. C.; J. B. Smith.

Type.—U. S. Nat. Museum.

This species is very closely related to *G. huronicus,* but it seems to be sufficiently distinct as shown by the number of coxal pores, which are 25–30 in number in *smithi,* but only 7 or 8 in *huronicus;* also by the number of pairs of legs (*huronicus,* ♂ 53–55, ♀ 55–57).

This species is described from two females, one of which is an adult, the other being about three-fourths grown.

28. Geophilus bipuncticeps Wood. Macon, Ga.; L. M. Underwood.

Pairs of legs, ♂ 55, ♀ 55–59.

29. Scolopocryptops sexspinosus Say.

Scolopocryptops georgicus Meinert, Proc. Amer. Phil. Soc., 180, 1886 (*Georgia*). Acc. 19542, 24, Tallulah, Ga.; L. M. Underwood. Acc. 19542, 14, Indian Springs, Ga.; L. M. Underwood. Luray, Va.; L. M. Underwood.

The specimens contained in the first two vials seem to belong to that phase of *S. sexspinosus* which has been described by Meinert under the name of *S. georgicus.* The only real tangible difference I can find between these specimens and the true *sexspinosus* is in the moderately toothed condition of the prosternum, and I think it is best to consider *georgicus* as not a valid species.

30. Theatops posticus Say. Acc. 19542, 3, Macon, Ga.; L. M. Underwood. Luray and Natural Bridge, Va.; L. M. Underwood.

31. Cryptops hyalinus Say. Natural Bridge, Va., and Lookout Mountain; L. M. Underwood.

Serratures of anal legs 6–2.

32. Scolopendra woodi Meinert. Acc. 19542, 1, Indian Springs, Ga.; L. M. Underwood.

33. Scolopendra heros Girard. Florida, F. B. Meek; Fort Reynolds, A. Clough.

34. Scolopendra pachypus Kohlrausch. Acc. 4631, San Diego, Cal.

As shown by the character of the anal legs this species seems to be sufficiently distinct from *heros*.

35. Lithobius proridens Bollman. Washington, D. C.; J. B. Smith.

One specimen.

36. Lithobius obesus Stuxberg. No. 73*a*, U. S. N. M., Salt Lake City, Utah.

In this vial, along with a few hexopods, I found a male *Lithobius*, which I provisionally refer to this species.

As this is a male, the following differences are worthy of notice:

Antennæ 22-jointed; coxal pores 2, 3, 4, 3; spines of first pairs of legs 2, 3, 2; of anal pair 1, 3, 2, 0; anal legs of male moderately crassate, tibia slightly swollen, excavated on the inner side near the base and the upper interior angle produced into a slight pilose lobe; last tarsal joints of legs more densely pilose beneath than the rest.

In the character of the anal legs this specimen agrees with *paradoxus*, but that species has the number of coxal pores and the spines of the anal legs less.

37. Lithobius elattus, sp. nov.

Diagnosis.—Related to *L. pullus*, but spines of anal legs, 1, 3, 2, 0, or 1, 3, 1, 0; joints of antennæ 20–22; tarsal lobe of anal legs of male larger; size smaller than *L. pullus*.

Habitat.—Washington, D. C. (J. B. Smith); Marksville, Va. (L. M. Underwood).

Type.—U. S. Nat. Museum.

Description.—Light brown, head and antennæ darker; tip of antennæ rufous. Moderately robust, smooth, sparsely pilose; head of about equal length and breadth. Antennæ moderate, articles 20–22. Ocelli 8–10, arranged in 3–4 series. Prosternal teeth 2 + 2. Coxal pores 2, 3, 3, 2–3, 4, 4, 3, round. Spines of first pair of legs 1, 2, 1; of penultimate pair 1, 3, 3, 2; of anal pair 1, 3, 2, 0–1, 3, 1, 0.

Male: Anal legs more crassate; first tarsus of anal legs prolonged into a pilose lobe at its upper anterior angle. Female: Claw tripartite, short and wide; spines 2 + 2, short and stout, end flattened and barely serrate. Length 8–9.5^{mm}.

This species is described from four specimens, three females and one male from Washington, D. C., and a male from Marksville, Va.

Although the above descriptions hardly seem to do justice in separating this new species from *L. pullus*, yet, when we place the two species side by side, they can not be mistaken, as the size of *pullus* is always 2–4^{mm} larger.

Time may prove that this new species is only an eastern variety of *L. pullus*, but until intermediate specimens are found it is best to consider them as distinct species.

38. Lithobius kochi Stuxberg. West Cliff, Colo.; T. D. A. Cockerell.

Anal legs armed with two claws. Coxal pores few in a single series. Penultimate pair of legs armed with two claws. Coxæ of last two pairs of legs laterally armed. Testaceous brown, antennæ and head darkest, legs paler. Moderately slender, smooth, sparsely pilose; head of about equal length and breadth. Antennæ short, reaching to the fifth segment, articles 20. Ocelli 8 or 9, arranged in 4 series. Prosternal teeth 2 + 2. Coxal pores 2, 2, 3, 3–3, 3, 3, 3, round. Spines of first pair of legs 1, 1, 1; of penultimate pair 1, 3, 3, 2; of anal pair 1, 3, 2, 0.

Male: Anal legs somewhat stouter than those of female. Female: Claw of genitalia bipartite, short and wide; spines 2 + 2; inner much shorter. Length 7–7.8mm.

I at first considered these specimens as representing a new species, but as the apparent differences gradually dwindled down to the number of spines of the first pair of legs, I finally concluded that they were identical with *kochi*, which has only been found at Saucelito, Cal.

For the sake of completeness I have given a description of the specimens.

39. Lithobius atkinsoni Bollman. Macon, Ga.; L. M. Underwood.

Among the material sent by Dr. Underwood are three specimens, two females and one male that I refer to this species.

The following points are worthy of notice: Antennæ 21–33 articulated; ocelli 8–20, arranged in 4–7 series; prosternal teeth 5+5 or 7+7; coxæ of last three pairs of legs laterally armed; coxal pores 3, 4, 4, 4–6, 7, 7, 6, round or transverse; spines of first pair of legs, 1, 2, 1 or 2, 3, 1; spines of anal and penultimate pairs 1, 3, 3, 1; last two tarsal joints of anal and penultimate pairs of legs of male sulcate on the inner side.

40. Lithobius xenopus, sp. nov.

Diagnosis.—Related to *L. mordax*, but the femoral and tibial joints of the anal legs of male strongly modified.

Habitat.—Macon, Ga.; L. M. Underwood.

Type.—Acc. 19542, 22, U. S. Nat. Museum.

Description.—Brown, head rufous, antennæ dark, legs pale. Moderately slender, rather smooth, sparsely pilose; head wider than long (4:3). Antennæ moderately long, reaching the seventh segment, articles 30, short. Ocelli 32, in 7 transverse series. Prosternal teeth 6+7. Coxal pores 6, 6, 6, 4, round. Spines of first pair of legs 2, 3, 2; of penultimate pair 1, 3, 3, 2; of anal pair 1, 3, 3, 2. Claws of anal and penultimate pairs of legs single. Coxæ of the last three pairs of legs laterally armed.

Male: Anal legs moderately short; femora considerably swollen on the inner side, and armed on the posterior half with two large, slightly curved, bluntly serrated spines; tibia excavated on the inner side; the posterior half produced into a bipartite contorted lobe, of which the posterior is armed with a short, curved, sharply serrated spine. The last two tarsal joints of anal and penultimate pairs of legs sulcate on the inner side. Length, 17.5mm.

Although the males of nearly every species of the subgenus *Neolithobius* show some modifications of the anal legs, yet this species presents a curious peculiarity and approaches to that of *L. bilabiatus* in the extent of the modification. The above description is based upon a single male specimen.

41. Lithobius latzeli Meinert. Marksville and Luray, Va.; L. M. Underwood.

Antennæ, 29–34; coxal pores, 5, 6, 5, 4–6, 7, 7, 6; prosternal teeth, 9+9 or 10+10; spines of first pair of legs, 2, 3, 2; spines of anal and penultimate pairs, 1, 3, 3, 2.

42. Lithobius underwoodi, sp. nov.

Diagnosis.—Related to *L. juventus*, but the prosternal teeth 6+7; coxal pores, 7, 7, 7, 6, transverse; size much larger.

Habitat.—Macon, Ga.; L. M. Underwood.

Type.—Acc. 19542, 22; U. S. Nat. Museum.

Description.—Dark shining brown, head and antennæ darkest, legs paler. Robust, attenuated posteriorly, moderately smooth; head wider than long (4:3). Antennæ long, extending to the tenth segment, articles 32. Ocelli 25, in 6 transverse series. Prosternal teeth 6+7. Coxal pores, 7, 7, 7, 6, transverse. Spines of first pair of legs, 2, 3, 2; of penultimate and anal pair, 1, 3, 3, 2. Anal and penultimate pairs of legs each with two claws. Coxæ of the last three pairs of legs laterally armed.

Female: The last two tarsal joints of anal and penultimate pairs of legs sulcate on the inner side; claw of genitalia large and long, indistinctly tripartite; spines 2+2, stout, inner shortest. Length, 20mm.

This species is very different from *L. juventus*, which is the only North American species belonging to the same group, although they may have originally sprung from the same stock. This species is described from a female which has the anal pairs of legs broken off.

43. Lithobius rex, sp. nov.

Diagnosis.—Related to *L. validus*, of Europe, but the antennæ 20-jointed.

Habitat.—Tallulah, Ga.; L. M. Underwood.

Type.—Acc. 19542, 21; U. S. Nat. Museum.

Description.—Grayish-brown, head, antennæ, first dorsal plate, and margins of others dark. Robust, attenuated posteriorly, dorsal plates ch wrinkled, sparsely pilose; head wider than long (6:5). Antennæ

long, extending to the ninth segment, articles 20, long. Ocelli 19, in 6 transverse series. Prosternal teeth 9+9. Coxal pores, 8, 8, 8, 7, large, transverse. Spines of the first pair of legs, 1, 3, 2; of the penultimate pair, 1, 3, 3, 2; of anal pair, 1, 3, 2.

Female: Claw of genitalia wide and short, tripartite; spines 2+2, short and stout, ends flattened and obscurely serrate. Length, 25^{mm}.

This species is described from a female specimen, which has the fourth segment considerably angulated, and I at first placed it in a new subgenus. But a study of *multidentatus* showed that the angulation of the fourth dorsal plate was subject to considerable variation.

This is the only North American species of the subgenus *Eulithobius* that has the coxal pores in a single series, and in this respect approaches *L. validus* of Europe; but that species has 40–48 antennal joints. Acc. 19542, 21 contains a female of this species.

44. Lithobius multidentatus Newport. Marksville and Natural Bridge, Va.; L. M. Underwood.

INDIANA UNIVERSITY, *December 1, 1888.*

[From *Proc. U. S. Nat. Mus.* XI, 1888, pp. 403–410.]

CATALOGUE OF THE MYRIAPODS OF INDIANA.*

BY CHARLES H. BOLLMAN.

The following catalogue of the myriapods of the State of Indiana is based largely upon the material contained in the museum of the Indiana University and my own private collection. I have also included any notes, bearing upon the myriapods of Indiana, that I have found in the papers of other authors. The material in the museum of the Indiana University and my own collection is principally from the following localities:

Boswell, Benton County	D. M. Mottier.
La Fayette, Tippecanoe County	F. M. Webster.
Kokomo, Howard County	A. W. Moon.
Westfield, Hamilton County	F. C. Test.
Indianapolis, Marion County	F. C. Test.
Hagerstown, Wayne County	F. C. Test.
Richmond, Wayne County	F. C. Test.
Dublin, Wayne County	Jerome McNeill.
Greencastle, Putnam County	O. P. Jenkins.
Terre Haute, Vigo County	W. S. Blatchley.
Connersville, Fayette County	Robert Hesler.
Brookville, Franklin County	A. W. Butler.
Bloomington, Monroe County	C. H. Bollman.
Lawrenceburgh, Dearborn County	D. M. Mottier.
Mitchell, Lawrence County	C. H. Bollman.
Salem, Washington County	C. H. Bollman.
New Providence, Clark County	C. H. Bollman.
Wyandotte, Crawford County	C. H. Bollman.
New Harmony, Posey County	R. D. Owen.

I desire to express my thanks to the following-named gentlemen, who have kindly collected specimens for me, thus enabling me to make this catalogue much more complete and satisfactory than would have been possible without their aid. As more species have been found about Bloomington I have given it, when mentioning the localities of the different species, precedence over the other places.

I do not mean to say that this list is complete, for I think the following additional species will some time be found within the limits of the State: *Parajulus canadensis*, *Parajulus diversifrons*, *Polydesmus pinetorum*, *Theatops spinicaudus*, *Henicops fulvicornis*, and *Lithobius mordax*.

* This catalogue is prepared partly from material in the U. S. National Museum collection, and the author has deposited types of the species in the Museum.—C. V. RILEY, *Curator of Insects*.

1. **Polyzonium rosalbum** (Cope).

Common: Bloomington; Terre Haute.

2. **Spirobolus americæ-borealis** (Beauvois).

Common: Bloomington; Boswell; Kokomo; La Fayette; Terre Haute; Greencastle; Brookville; New Providence; Wyandotte; New Harmony.

3. **Parajulus venustus** (Wood).

Common; Kokomo; La Fayette; Westfield; Terre Haute; Greencastle; Salem; Brookville; New Harmony.

4. **Parajulus impressus** (Say).

Rare: Bloomington; Connersville; Brookville.

5. **Parajulus rugosus** (Bollman).

Rare: Terre Haute.

6. **Parajulus pennsylvanicus** (Brandt).

Common: Bloomington; Wyandotte; Brookville.

7. **Cambala annulata minor**, subsp. nov.

Diagnosis: Similar to *C. annulata*, but much smaller and of a yellowish-brown shade.

Habitat: Bloomington, Greencastle, Salem, New Providence, Wyandotte, and New Harmony, Ind.; Little Rock, Ark.

Types: U. S. National Museum.
Nos. 1, 97, 109, collection Indiana University.
Nos. 24, 376, 440, author's collection.

Cambala annulata.

Author's collection.	Habitat.	Collector.	Length.	Width.
			mm.	*mm.*
278	Chapel Hill, N. C.	G. F. Atkinson	58	3.1
225	Mossy Creek, Tennessee	C. B. Brunner	45	3.
229	do	do	40	2.5

Cambala annulata minor.

424	Bloomington, Ind.	C. H. Bollman	37	1.5
424	do	do	25.5	1.2
376	Wyandotte, Ind.	do	30	1.3
440	Little Rock, Ark.	W. J. Hutcherson	27.5	1.5
440	do	do	25	1.2

The above figures clearly show the difference in size between the two forms. The color of *C. annulata* is a dark brown, while that of *minor* is usually more yellow.

C. annulata minor is abundant in southern Indiana, and I have over twenty-five specimens from Little Rock.

The specimens Packard has recorded as occurring in Little Wyandotte Cave, Indiana, and Zwingler's and Carter's Caves, Kentucky, are probably examples of this new geographical subspecies, but they may be cave varieties.

8. Julus hortensis (Wood).

Common: Hagerstown; Indianapolis; Connersville; New Harmony.

9. Julus virgatus (Wood).

Common: Bloomington; Westfield; Connersville; Salem.

10. Nemasoma stigmatosum (Brandt).

Rare: Bloomington.

11. Nemasoma minutum (Brandt).

Common: Bloomington; Indianapolis; Salem; New Providence.

A careful examination of the above two species has shown that they should be put in the European genus—*Nemasoma* Koch.

12. Callipus lactarius (Say).

Abundant: Bloomington; La Fayette; Kokomo; Westfield; Terre Haute; Greencastle; Brookville; Salem; New Providence; Wyandotte.

13. Campodes flavicornis Koch.

Very common: Bloomington; La Fayette; Salem.

14. Scotherpes lunatus (Harger).

Common: Bloomington; Salem.

15. Scotherpes wyandotte, sp. nov.

Diagnosis: Related to *Sc. lunatum* (Harger), but the color dark, ocelli arranged in a triangular patch, and the body larger and more robust.

Habitat: Wyandotte, Indiana.

Type: U. S. National Museum.

Description: Body stout, short, scarcely depressed. Dorsal plates reticulated; lateral carinæ as in *lunatum*. Ocelli 16–4, in a triangular patch. Yellowish-brown; legs pale. Length, 10^{mm}; width, 1.5^{mm}.

This new species is described from a female which was found a few miles north of Wyandotte Cave, Crawford County.

16. Scotherpes bollmani (McNeill).

Abundant: Mayfield's, Neeld's, Truett's and Coon's Caves, Bloomington; Phitt's and Donehue's Caves, Bedford, Ind.

17. Pseudotremia cavernarum (Cope).

Wyandotte, Little Wyandotte, Bradford and Marengo Caves, Crawford County, Ind.

18. Pseudotremia carterensis (Packard).

Around the mouth of a well at the foot of the path leading from the hotel, past Little Wyandotte Cave, I obtained five specimens of a *Craspedosoma* that seem to agree with the description of *Pseudotremia cavernarum carterensis* Packard from Bat, X, and Zwingler's Caves, Kentucky.

That this is a distinct species and not merely a variety of *C. cavernarum* is distinctly shown by the male copulation foot, the size and color of body, and its *habitat.*

My largest specimen—a male—is 30^{mm} long and 2.2^{mm} wide.

19. Leptodesmus placidus (Wood).

Mr. Mottier has sent me two specimens of this rare species from Boswell, Benton County.

20. Fontaria virginiensis (Drury).

Common: Bloomington; Boswell; Westfield; Terre Haute; Connersville; Brookville. This is the species described from Brookville by Mr. McNeill under the name of *Polydesmus butleri.**

21. Fontaria coriacea Koch.

Polydesmus corrugatus Wood, Proceed. Acad. Nat. Sci. Phila., 6, 1864 (*Michigan, New York*).

Common: Bloomington; Boswell; Kokomo; Wyandotte.

A comparison of specimens of *corrugata* Wood with Koch's figures and descriptions of *coriacea* shows that they are the same. Koch's figures show a broad yellow band along the posterior margin of each segment. This is a character common to the eastern specimens, but rare in the western forms.

22. Fontaria indianæ, sp. nov.

Diagnosis: Related to *Fontaria coriacea* Koch, but the copulation foot expanded near the middle, end angularly bent inwards, basal spine *bifid;* lateral carinæ more rounded; legs of male stouter; segments always margined posteriorly with yellow.

Habitat: Hagerstown and Brookville.

Types: U. S. National Museum (Brookville and Hagerstown). No. 37, Museum Indiana University (Brookville). No. 519, author's collection (Brookville). No. 253, author's collection (Hagerstown).

Measurements of Fontaria indianæ.

	Habitat.	Collector.	Length.	Width.	Height.	Sex.
			mm	*mm*	*mm*	
No. 37, Museum Indiana University.	Brookville....	A. W. Butler.	34	9	5.5	♂
No. —, U. S. National Museum	....do	....do	38	8.5	6.5	♀
No. 519, author's collection.....	....do	....do	39	9	6	♀
No. —, U. S. National Museum	....do	....do	31	7.5	4.5	♂
No. 253, author's collection.....	Hagerstown ..	F. C. Test	38	8	6	♀

* *Polydesmus butleri* McNeill, Bull. Brook. Soc. Nat. Hist., No. 3, 6, 1888 (*Brookville, Ind*).

This species is described from ten specimens, four females and three males, from Brookville, Franklin County, and three females from Hagerstown, Wayne County. It agrees with the eastern specimens of *coriacea* in having a broad yellow band along the posterior margin of each segment, but the shape of the male copulation foot, especially the *bifid* character of the basal spine, will serve to distinguish it from *coriacea*.

23. Fontaria butleriana, sp. nov.

Diagnosis: Related to *Fontaria coriacea* Koch, but the segments strongly attenuated posteriorly; size larger and width less in proportion to the length; dark greenish-black, with a narrow yellow line along the posterior border of each segment.

Habitat: La Fayette and Brookville.

Type: U. S. National Museum; No. 520, author's collection.

Measurements of Fontaria butleriana.

	Habitat.	Collector.	Length.	Width.
			mm	*mm*
No. —, U. S. National Museum	La Fayette, Ind.	F. M. Webster	44	11
No. 520, author's collection	Brookville, Ind.	A. W. Butler	41	10

The above measurements, when compared with those of *Fontaria coriacea* clearly show the difference in size.

This species is described from two females—one from each locality.

It approaches very closely to Koch's figures of *F. virginiensis*, and it is probable that he has described this species as *virginiensis*.

24. Euryurus erythropygus (Brandt).

Abundant: Bloomington; Boswell; La Fayette; Kokomo; Westfield; Terre Haute; Greencastle; Mitchell; Salem; New Providence; Brookville; Wyandotte.

25. Scytonotus granulatus (Say).

Abundant: Bloomington; La Fayette; Westfield; Greencastle; Salem; New Providence.

26. Scytonotus cavernarum Bollman.

Bloomington; Mayfield's Cave; only the original type known.

27. Chætaspis albus Bollman.

Not common: Bloomington; Salem; New Providence.

28. Polydesmus testi Bollman.

Rare: Indianapolis.

29. Polydesmus minor Bollman.

Boswell. One specimen.

30. **Polydesmus serratus** Say.
Abundant throughout the State.

31. **Eurypauropus spinosus** Ryder.
Abundant: Bloomington.

32. **Pauropus lubbocki** Packard.
Rare: Bloomington.

33. **Linotænia chionophila** (Wood).
Common: Bloomington; La Fayette.

34. **Linotænia fulva** (Sager).
Common: Bloomington; Brookville; Salem.

35. **Linotænia ruber** Bollman.
Common: Bloomington; Boswell; La Fayette; Westfield; Greencastle; Salem; Brookville; New Providence; Wyandotte.

36. **Geophilus brunneus** McNeill.
Common: Bloomington.

37. **Geophilus salemensis** Bollman.
Common: Salem; Wyandotte.

38. **Geophilus varians** McNeill.
Very common: Bloomington; Salem; New Providence.

39. **Geophilus umbraticus** (McNeill).
Common: Bloomington; Boswell; Salem.

40. **Geophilus indianæ** McNeill.
Rare: La Fayette (*McNeill*).

41. **Geophilus rubens** Say.
Common: Bloomington.

42. **Geophilus oweni** Bollman.
New Harmony. Two type specimens.

43. **Geophilus smithi** Bollman.
Bloomington: One specimen; length 36^{mm}.

44. **Geophilus setiger** Bollman.
Rare: Salem.

45. **Geophilus strigosus** (McNeill),
Rare: Bloomington; Salem.

46. **Geophilus foveatus** (McNeill).
Not common: Bloomington; Salem; Lawrenceburgh.

47. Geophilus attenuatus Say.

Common: Boswell; La Fayette; Kokomo; Westfield; Terre Haute; Brookville; Wyandotte.

48. Scolopocryptops sexspinosus (Say).

Very common throughout the State.

49. Scolopocryptops nigridius McNeill.

Common: Bloomington; Greencastle; Brookville; Salem.

50. Cryptops hyalinus Say.

Common; Bloomington; Salem; New Providence; Wyandotte.

51. Theatops posticus (Say).

Common: Bloomington; New Providence; Wyandotte.

52. Scolopendra woodi Meinert.

Bloomington. Two specimens.

53. Lithobius proridens Bollman.

Common: Bloomington; La Fayette; Richmond; Brookville; Salem; New Providence; Wyandotte.

54. Lithobius jowensis Meinert.

Very common: Bloomington; La Fayette; Richmond; Greencastle; Salem; New Providence; Wyandotte.

All the specimens I have examined differ from *jowensis* by having the first pair of legs armed with 2, 3, 2 or 2, 3, 1 spines instead of 2, 1, 1, as Meinert states; also, by having the inner spine of ♀ genitalia much shorter than the outer. These specimens may represent a geograpical variety of *jowensis*, but until the *habitat* of *jowensis* and more specimens can be obtained it is not safe to describe them as such.

55. Lithobius bilabiatus Wood.

Lithobius tuber Bollman. Proceed. U. S. Nat. Mus., 256, 1887.

Rare: Bloomington.

56. Lithobius trilobus Bollman.

Not common: Bloomington; Salem.

57. Lithobius pullus Bollman.

Rare: Bloomington.

58. Lithobius cardinalis Bollman.

Common: Bloomington; Westfield; Salem; New Providence.

59. Lithobius howei Bollman.

Common: Bloomington; Kokomo; Dublin.

60. Lithobius forficatus (Linnæus).

Common in northern part of State, but rare in the southern parts. Bloomington; Westfield; Connersville; Greencastle; Lawrenceburgh.

61. Lithobius tyrannus Bollman.

Common: Bloomington; La Fayette; Greencastle; Salem; New Providence.

62. Lithobius juventus Bollman.

Rare: Bloomington. Four specimens.

63. Lithobius multidentatus Newport.

Abundant throughout the State.

64. Scutigera forceps (Rafinesque).

Bloomington; New Harmony; Evansville.

INDIANA UNIVERSITY,
Bloomington, December 25, 1888.

[From *Proc. U. S. Nat. Mus.*, Vol. XII, 1889, pp. 211–216.]

MYRIAPODA.

BY C. H. BOLLMAN.

1. Spirobolus sanctæ-luciæ, sp. nov.

Diagnosis.—Allied to *Spirobolus surinamensis* Bollman; but the horse-shoe-like markings only prominent along the middle line of segment; no deep sulcus behind repugnatorial pore; legs light yellow.

Type.—No. 590.

Habitat.—Port Castries, St. Lucia, Windward Islands.

Description.—Segments dark brown, posterior borders lighter; anterior margin of first pale; head and first dorsal plate greenish; antennæ pale brown; legs very light yellow (pale), probably red in life.

Rather slender, anterior segments attenuated.

Venter slightly reticulated, sulcus very indistinct; clypeus not deeply excised, foveolæ 2+2, distant, sulcus shallow.

Antennæ slenderer than in *surinamensis*, hardly reaching second segment.

Ocelli about 40, in a series, patch suboval.

Segments shining, rather smooth, especially posteriorly; anterior ten segments with distinct concentric striæ on basal part; posterior part, especially on anterior segments, sulcate beneath; division of segments not evident, a hollow depression along which are horseshoe-like depressions; these are scattered over the dorsal part of segments, but are small and shallow; the posterior four segments almost destitute of markings.

First segment narrowed laterally, anterior margin concave, a strong marginal sulcus.

Anal segment obtusely angled, not surpassing valves; anal valves narrowly margined, reticulated; anal scale very slightly rounded, almost transverse.

Repugnatorial pore large, situated in hollow on anterior part.

Legs extending slightly beyond sides of body.

Segments 50.

Length of body 45^{mm}; width 3.4^{mm}. This species is described from an adult female; in the same vial is a very young specimen, showing only 41 segments. In Karsch's "*Neue Juliden des Berliner Museum*" this species would stand near *Spirobolus biconicus* from Mauritius.

2. Himantarium tæniopse (Wood).

No. 599, Margarita Island, Lower California; ♀.

A young specimen. Pairs of legs, 148.

3. Pectiniunguis americanus, gen. et sp. nov.

Diagnosis.—Related to *Schendyla eximia* Meinert; but the anal pair of legs jointed and the claw of maxillary palpus pectinate along its entire under side.

Type.—No. 598.

Habitat.—Pichiliugue Bay, Gulf of California.

Description.—Orange, darkest anteriorly; legs pale.

Robust, scarcely attenuated anteriorly, more posteriorly.

Segments not polished, very finely reticulate; sparsely pilose.

Prehensorial legs not reaching base of antennæ; sternum almost twice as wide as long, anterior margin slightly callous; coxæ of about equal length and width, unarmed, anterior margin not much sinuate.

Cephalic plate slightly longer than wide; basal plate three times as wide as long; pre-basal plate exposed. Antennæ filiform, rather long.

Dorsal plate manifestly bisulcate.

Spiracles suboval, longitudinal, anterior largest.

Ventral plates not sulcate; porous area suboval, much smaller on posterior segments; last ventral plate very wide, pilose, sides converging.

Posterior pleuræ large, pilose; pores large, concealed.

Anal pair of legs 6-jointed, moderately crassate, joints all large, densely pilose; unarmed.

Pairs of legs ♀ 65.

Length 50^{mm}; width 1.55^{mm}.

This species is described from an adult female.

According to Meinert's diagnosis of the genus *Schendyla* this species would be included under that genus; but the three known species may be separated by the following generic characters:

a. Claw of maxillary palpus not pectinate, outer part of first pair of maxillæ without a trace of a lateral process; labrum entirely united, teeth 20–22, equal; anal legs 6-jointed ..... *Nemorensis.*

aa. Claw of maxillary palpus pectinate; outer part of first maxillæ with a small lateral process; labrum free in the middle.

b. Anal pair of legs 5-jointed; claw of maxillary palpus only pectinate under the apex; labral teeth about 15, equal; first joint of anal legs almost coalesce with second ..... *Eximia.*

bb. Anal pair of legs 6-jointed; claw of maxillary palpus pectinate for its entire length; labral teeth 8+10+8, the outer enlarged; first joint of anal legs not coalesced with second ..... *Americanus.*

On account of these generic differences between the three species, especially between the first and the last two, I have thought it best to place *americanus* and *eximia* under the new genus *Pectiniunguis*, of which *americanus* is the type, restricting *Schendyla* to *nemorensis*.

The generic differences between *americanus* and *eximia* are no doubt worthy of subgeneric rank, and I therefore propose the name *Nannopus* for the reception of *eximia*.

4. Scolopendra macracanthus, sp. nov.

Diagnosis.—Allied to *Scolopendra subspinipes* Leach; but the femora of anal legs armed beneath with *three* spines, of which the two anterior are very large, the superior interior surface armed with six spines; the first *nine* dorsal plates immarginate.

Type.—No. 165F.

Habitat.—Pacific coast, some place between Lower California and Straits of Magellan.

Description.—Brownish-green; tip of antennæ and lateral parts of dorsal plates green; head and first dorsal plate darker.

Rather slender, smooth, only lightly punctate anteriorly.

Head suborbicular, punctate, not sulcate.

Antennæ, 18-jointed; articles moderate, the first six not hirsute.

Prosternal teeth 5+5, the inner two small and coalesced; coxal tooth large, apex carinate, nodule present.

Dorsal plate, except the first nine (10), marginate; sulci beginning at the third and indistinct on the posterior; posterior border transversely wrinkled.

Sulci of ventral plates distinct; last ventral plate long and narrow, sides converging, posterior border rounded.

Second tarsal joint of all the legs, except anal, armed beneath with a spine.

Anal legs long, slender; femora, with six spines on the superior interior surface, arranged in three series; three beneath, uniseriate, the anterior two largest; apical process bifid.

Posterior pleuræ densely porose; angular process small, bifid.

Length 120^{mm}.

In the collection is a specimen without a more definite locality than "Pacific coast."

The following key will help to separate it from the related species:

Femora of penultimate pair of legs unarmed; first dorsal plate without a transverse furrow; tarsal joints armed.

a. Femora of anal legs unarmed beneath, two spines within; the first 6–11 dorsal plates immarginate; last two tarsal joints unarmed ..... DEHAANI.

aa. Femora of anal legs armed beneath.

b. Spines of femora of anal legs 4–6, always two beneath; the first four or five dorsal plates immarginate; the last or the last two tarsi unarmed. SUBSPINIPES.

bb. Spines of femora of anal legs 9, 3 beneath; the first nine dorsal plates immarginate; the last tarsal joint unarmed ..... MACROCANTHUS.

5. Scolopendra microcanthus, sp. nov.

Diagnosis.—Allied to *Scolopendra pernix* Kohlrausch, but the anal pair of legs slender, spines small, and more numerous.

Type.—No. 600.

Habitat.—St. Margarita Island, Lower California.

Description.—Pale green, posterior border of segments dark; prehensorial legs orange.

Slender; smooth, very lightly punctate.

Head suboval, punctate; sulci absent.

Antennæ 25–29-jointed, long, basal not very crassate, the first 3 or 4 smooth.

Prosternal teeth 4+4, inner coalesced; coxal tooth large, inner margin unarmed.

The first 15 dorsal plates immarginate; sulci well developed, and commencing at transverse suture of first plate and dividing them into three planes.

Sulci of ventral plates shallow, last plate short and wide, sides converging, rounded, posterior margin emarginate.

Second tarsal joints of all legs, except anal, armed.

Anal pair of legs slender, as in *heros;* spines very small; 8–12, in 3 or 4 series on the superior-interior surface; 4 or 5 in 2 series on the inner surface; beneath 10–12 in 2 or 3 series; apical process large and blunt, armed with 9–11 small spines.

Posterior pleuræ narrow; apex long, armed with 7–9 spines, posterior margin concave; a marginal spine.

Length, 75^{mm}.

Described from one specimen of which the anal pair of legs is broken off.

This new species is separated from *heros*, *pachypus*, *nicaraguensis*, and *viridis* by the large number of spines of apical process of femora and the well-marked sulci of first dorsal plate.

6. Scolopendra galapagoensis, sp. nov.

Diagnosis.—Related to *Scolopendra viridicornis* Newport, but the spines of apical process of femora of anal legs, 6–8; spines of apex of posterior pleuræ, 9–12; spines of femora of 2–20 pairs of legs, 4 or 5.

Type.—No. 594.

Habitat.—Chatham, James, and Albemarle Islands, Galapagos Archipelago.

Description.—Very dark brown, more yellowish posteriorly; under parts more brown than upper; the first five or six antennal joints dark blue, rest rusty; tarsi brownish, rest of legs bluish brown, except base of femora, which is more brown, like ventral plates; posterior pleuræ and femora of anal legs reddish brown.

Robust, smooth, all parts very slightly punctate.

Head suboval; two longitudinal sulci, which break up posteriorly, and send a branch along lateral margin.

Antennæ long, 17-jointed, articles long, basal subcrassate, the first four or five not hirsute.

Prosternal teeth 3+3, large, inner coalesced; a transverse sulcus along anterior part of sternum.

The first four dorsal plates immarginate; posterior borders transversely wrinkled; crest of anal segment weak, only extending three-fourths of the way.

Sulci of ventral plates distinct; last plate rather short, narrow, posterior border rounded.

Second tarsal joint of all the legs, except anal pair, armed. Anal legs rather long and stout; 10–13 spines on the superior-interior surface of femora arranged in 3 series; within are 2 or 3 uniseriate spines; beneath 7–9 spines arranged in 2 or 3 series; apical process with 6–8 spines.

Femora of 2–20 pairs of legs armed with 4 or 5 spines at their exterior apex, the posterior usually with 5 spines; femora of penultimate pair of legs armed above with 1–3 spines.

Posterior pleuræ with 9–12 apical spines and 1 or 2 marginal; above on margin of dorsal plate are 2 small spines.

Length of largest specimen 160mm.

This species is described from two adult and one young specimen from Chatham Island, one young individual from James Island, and another from Albemarle Island. The type is an adult from Chatham Island.

The five species belonging to this group of *Scolopendra* may be separated as follows:

Femora of penultimate pair of legs armed; first dorsal plate with a transverse sulcus.
a. Ventral plates not sulcate; tibiæ of anal legs armed with spines.....PRASINA.
aa. Ventral plates with two longitudinal sulci.
b. Last dorsal plate without a median carina.
c. Femora of last three pairs of legs armed; tibiæ of anal legs unarmed. VALIDA.
cc. Femora of all legs armed; tibiæ of anal legs armed.....GIGAS.
bb. Last dorsal plate with a median carina.
d. Femora of penultimate pair of legs not armed above; spines at apex of femora of 2–20 pairs of legs, 2 or 3; spines of apical process of anal legs, 1–3; spines of apex of anal pleuræ, 1–3.....VIRIDICORNIS.
dd. Femora of penultimate pairs of legs with 1–3 spines above; spines of apex of femora of 2–20 pairs of legs, 4 or 5; spines of apical process of femora of anal legs, 6–8; spines of apex of anal pleuræ, 9–12.
GALAPAGOENSIS.

7. Scolopendra sp. ?

No. 591, Abrolhos Islands, Brazil.

A very young specimen and unidentifiable.

8. Henicops chilensis Gervais.

Henicops chilensis Gervais. Aptères, IV, 239, 1847 (Chile).

No. 593, Port Churruca, Straits of Magellan.

One young mutilated female.

Prosternal teeth, 4+4.

IV.

A CATALOGUE OF THE KNOWN MYRIAPODA OF NORTH AMERICA, NORTH OF MEXICO.*

BY CHARLES HARVEY BOLLMAN.

In examining the literature relating to the North American Myriapoda, I have found descriptions of a large number of species which do not seem to be known to specialists working in this branch. On account of these and the number of species recently described I have deemed it best to form a catalogue, believing it would be the best means of bringing these facts before students. I have used the same divisions as used by Packard in the Third Report of the U. S. Entomological Commission.

Order DIPLOPODA.

Suborder COLOBOGNATHA.

Family POLYZONIDÆ.

I. POLYZONIUM Brandt.

1. P. rosalbum (Cope).
Petaserpes rosalbus Cope. Trans. Amer. Entom. Soc., III, 65 (1870).
Hexaglena cryptocephala McNeill. Proc. U. S. Nat. Mus., X, 328 (1887).—E.

II. OCTOGLENA Wood.

1. O. bivirgata Wood. Proc. Phila. Acad., 1864, 186; Trans. Amer. Philos. Soc. XIII, 229 (1865). Georgia.

III. PLATYDESMUS Lucas.

1. P. lecontei (Wood).
Brachycybe lecontei Wood. Proc. Phila. Acad. 1864, 187; Trans. Amer. Philos. Soc., XIII, 230 (1865).—Georgia, Tennessee.

2. P. roseus (Murray).
Brachycybe rosea Murray. Economic Entomology, I, Aptera, 21 (1877).
Platydesmus californicus Karsch. Mitth. Münch. Ent. Ver., IV, 144 (1881). California.

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* In Mr. Bollman's MSS., sent me for examination after his death, there appeared this paper. In its original form the references to literature were given in footnotes, which made up fully half the paper. There were no references to species described in Wood's *Myriapoda of North America* (1865), and no synonyms were given. These have been added, together with additional species from his latest published papers, and the footnotes have been uniformly incorporated into the text, believing that this form will be most convenient for reference. In the geographic distribution NE. refers to the Atlantic Province, northern part; SE. to the Atlantic Province, southern part; and P. to the Pacific Province.—L. M. UNDERWOOD.

IV. ANDROGNATHUS Cope.

1. **A. corticarius** Cope. Proc. Amer. Philos. Soc., XI, 182 (1869). Virginia.

Suborder CHILOGNATHA.

Family JULIDÆ.

I. JULUS Linn.

1 **J. canaliculatus** Wood. Proc. Phila. Acad. 1864, 12; Trans. Amer. Philos. Soc., XIII, 201 (1865).—NE.
2. **J. cinerefrons** Wood. Proc. Phila. Acad. 1864, 13; Trans. Amer. Philos. Soc., XIII, 203 (1865).—Oregon.
3. **J. cœruleocinctus** Wood. Proc. Phila. Acad. 1864, 14; Trans. Amer. Philos. Soc., XIII, 204 (1865). *J. multistriatus* Walsh. Pract. Entom. 34 (1866).—NE.
4. **J. exiguus** Brandt. Recueil, 85 (1841); Wood. Trans. Amer. Philos. Soc., XIII, 199 (1865).—NE.
5. **J. hortensis** Wood. Proc. Phila. Acad., 1864, 14; Trans. Amer. Philos. Soc., XIII, 205 (1865).—NE.
6. **J. laqueatus** Wood. Proc. Phila. Acad., 1864, 13; Trans. Amer. Philos. Soc., XIII, 202 (1865).—NE.
7. **J. milesii** Wood. Proc. Phila. Acad., 1864, 13; Trans. Amer. Philos. Soc., XIII, 203 (1865).—NE.
8. **J. owenii** Bollman. Entom. Amer., II, 228 (1887); Ann. N. Y. Acad. Sci., IV, 25 (1887).—Indiana.
9. **J. virgatus** Wood. Proc. Phila. Acad., 1864, 14; Trans. Amer. Philos. Soc., XIII, 205 (1865).—NE.

II. NEMASOMA Koch.

1. **N. minutum** (Brandt).
   Julus minutus Brandt. Recueil, 89 (1841); Wood. Trans. Amer. Philos. Soc. XIII, 206 (1865).
   J. pusillus Say. Jour. Phila. Acad., II, 105 (1821).
   J. lineatus McNeill. Proc. U. S. Nat. Mus., X, 324 (1887).—E.
2. **N. stigmatosum** (Brandt).
   Julus stigmatosus Brandt. Recueil, 88 (1841); Wood. Trans. Amer. Philos. Soc., XIII, 206 (1865).
   J. punctatus Say. Journ. Phila. Acad., II, 102 (1821).—E.

III. SPIROSTREPTUS Brandt.

1. **S. clavipes** Koch. Syst. der Myriap., 105 (1847); Die Myriapoden, II, 103, t. CXV, f. 226 (1863).—Pennsylvania.
2. **S. montezumæ** (Sauss.).
   Julus montezumæ Sauss. Linnæa Entomologica, XIII, 330 (1859).
   Spirostreptus montezumæ Humb. et Sauss. Études sur les Myriap., 69 (1872).—Texas.
3. **S. multiannulatus** (McNeill).
   Julus multiannulatus McNeill. Proc. U. S. Nat. Mus., X, 331 (1887).—Iowa.
4. **S. nutans** Koch. Syst. der Myriap., 104 (1847); Die Myriapoden, I, 14, t. VII, f. 14 (1863).—"North America."

IV. SPIROBOLUS Brandt.

1. **S. agilis** Cope. Proc. Amer. Philos. Soc., XI, 181 (1869).—Virginia.
2. **S. angusticeps** Wood. Proc. Phila. Acad., 1864, 16; Trans. Amer. Philos. Soc., XIII, 181 (1865).—California.

3. **S. atratus** (Girard).*
   Julus atratus Girard. Rep. Marcy's Red River Exped., 245 (1853).—SE.
4. **S. californicus** Humbert et Saussure. Rev. et Magas. Zool., 1870, 177.—California.
5. **S. ignobilis** Humbert et Saussure. Rev. et Magas. Zool., 1870, 177.—"North America."
6. **S. marginatus** (Say).
   Julus marginatus Say. Jour. Phila. Acad., II, 105 (1821).
   Spirobolus marginatus Wood. Trans. Amer. Philos. Soc., XIII, 207 (1865).—E.
7. **S. ornatus** (Girard).*
   Julus ornatus Girard. Rep. Marcy's Red River Exped., 245 (1853).—SE.
8. **S. pensacolæ** Bollman. Entom. Amer., II, 227 (1887).—Florida.
9. **S. spinigerus** Wood. Proc. Phila Acad., 1864, 16; Trans. Amer. Philos. Soc., XIII, 211 (1865).—SE.
10. **S. uncigerus** Wood. Proc. Phila. Acad., 1864, 15; Trans. Amer. Philos. Soc., XIII, 209 (1865).—California.
11. **S. woodi** Humbert et Saussure. Rev. et Magas. Zool., 1870, 177.—Missouri.

V. PÆROMOPUS Karsch.

1. **P. lysiopetalinus** Karsch. Zeits. f. d. gesammt. Naturwiss., LIV, 12 (1881).—California.

VI. PARAJULUS Humb. et Sauss.

1. **P. cæsius** (Wood).
   Julus cæsius Wood. Proc. Phila. Acad., 1867, 43.—Texas.
2. **P. canadensis** (Newport).
   Julus canadensis Newport. Ann. and Mag. Nat. Hist., XIII, 268 (1844); Wood, Trans. Amer. Philos. Soc., XIII, 200 (1865).—NE.
3. **P. castaneus** Bollman. Entom. Amer., II, 226 (1887); Ann. N. Y. Acad. Sci., IV, 35 (1887).—Minnesota.
4. **P. diversifrons** (Wood).
   Julus diversifrons Wood. Proc. Phila. Acad., 1864, 13; Trans. Amer. Philos. Soc., XIII, 203 (1865).—NE.
5. **P. ellipticus** (Bollman).
   Julus ellipticus Bollman. Amer. Nat., XXI, 82 (1887).
   Parajulus ellipticus Bollman. Ann. N. Y. Acad. Sci., IV, 35 (1887).—Minnesota.
6. **P. furcifer** (Harger).
   Julus furcifer Harger. Amer. Jour. Sci., 3d ser. IV, 120 (1872).—Oregon.
7. **P. immaculatus** (Wood).
   Julus immaculatus Wood. Proc. Phila. Acad., 1864, 12; Trans. Amer. Philos. Soc., XIII, 200 (1865).—New York.
8. **P. impressus** (Say).
   Julus impressus Say. Jour. Phila. Acad., II, 102 (1821); Wood, Trans. Amer. Philos. Soc., XIII, 196 (1865).—NE.
9. **P. obtectus** Bollman. Entom. Amer., II, 227 (1887); Ann. N. Y. Acad. Sci., IV, 38 (1887).—E.
10. **P. oregonensis** (Wood).
    Julus oregonensis Wood. Proc. Phila. Acad., 1864, 11; Trans. Amer. Philos. Soc., XIII, 199 (1865).—P.
11. **P. pennsylvanicus** (Brandt).
    Julus pennsylvanicus Brandt. Recueil, 85 (1841); Wood, Trans. Amer. Philos. Soc., XIII, 201 (1865).
    J. montanus Cope. Proc. Amer. Philos. Soc., XI, 181 (1869).—NE.

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* These two species were referred by Wood to *S. marginatus*. [U.]

12. P. pilosiscutus (Wood).

Julus pilosiscuta Wood. Proc. Phila. Acad., 1864, 11; Trans. Amer. Philos. Soc., XIII, 198 (1865).—Pennsylvania.

13. P. varius Bollman. Entom. Amer., II, 227 (1887); Ann. N. Y. Acad. Sci., IV, 38 (1887).—California.

VII. NANNOLENE Bollman.

1. N. burkei Bollman. Entom. Amer., II, 225 (1887); Ann. N. Y. Acad. Sci., IV, 40 (1887).

Julus burkei Bollman. Amer. Nat., XXI, 82 (1887).—California.

VIII. CAMBALA Gray.

1. C. annulata (Say).

Julus annulatus Say. Jour. Phila. Acad., II, 103 (1821).

Spirobolus annulatus Wood. Trans. Amer. Philos. Soc., XIII, 212 (1865).

Cambala annulata Cope. Proc. Amer. Philos. Soc., XI, 181 (1869).—NE.

Family LYSIOPETALIDÆ.

I. LYSIOPETALUM Brandt.

1. L. costatum Karsch. Mitth. Münch. Ent. Ver., IV, 144 (1880).—"North America."

2. L. lactarium (Say).*

Julus lactarius Say. Jour. Phila. Acad., II, 104 (1821).

Spirostrephon lactarius Wood. Trans. Amer. Philos. Soc., XIII, 192 (1865).

Reasia spinosa Sager. Proc. Phila. Acad., 1856, 109.

Lysiopetalum lactarium Packard. Amer. Nat., XVII, 555 (1883); Proc. Amer. Philos. Soc., XXI, 184 (1883).

L. eudasum McNeill. Proc. U. S. Nat. Mus., X, 330 (1887).—E.

3. L. setigerum Karsch. Mitth. Münch Ent. Ver., IV, 144 (1880).—"North America."

Family CRASPEDOSOMIDÆ.

I. CAMPODES Koch.

1. C. flavicornis Koch. Syst. d. Myriap., 126 (1847); Die Myriapoden, II, 17, t. LXVIII, f. 140 (1863).

C. fuscicornis Koch. Syst. d. Myriap., 127 (1847); Die Myriapoden, II, 16, t. LXVIII, f. 139 (1863).

Spirostrephon cæsioannulatus Wood. Trans. Amer. Philos. Soc., XIII, 194 (1865).

Pseudotremia vudii Cope. Proc. Amer. Philos. Soc., XI, 180 (1869).

Cryptotrichus cæsioannulatus Packard. Proc. Amer. Philos. Soc., XXI, 192 (1883).—SE.

II. CRASPEDOSOMA Leach-Rawlins.

1. C. atrolineatum Bollman. Proc. U. S. Nat. Mus., X, 618 (1887).—British Columbia.

2. C. carinatum Bollman. Ann. N. Y. Acad. Sci. (1888), 109.—Tennessee.

3. C. flavidum Bollman. Entom. Amer., IV, 2 (1888).—Arkansas.

4. C. glomeratum (Harger).

Trichopetalum glomeratum Harger. Amer. Jour. Sci., 3rd series IV, 118 (1872).—Oregon.

5. C. ocellatum (Packard).

Polydesmus ocellatus Packard. Amer. Nat., XVII, 428 (1883).

Craspedosoma packardii Stuxburg. Amer. Nat., XIX, 400 (1885).—Oregon.

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* In one of Bollman's latest papers this is referred to *Callipus lactarius*. As the genus *Callipus* Risso is not certainly a synonym of *Lysiopetalum*, it is best to leave it *in the latter genus [U.]*.

III. CHORDEUMA Koch.

1. **C. iuloides** (Harger).
   Trichopetalum iuloides Harger. Amer. Jour. Sci., 3d ser. IV, 118 (1872).—Lake Superior district.

IV. PSEUDOTREMIA Cope.

1. **P. cavernarum** Cope. Proc. Amer. Philos. Soc., XI, 179 (1869).
   Spirostrephon cavernarum Cope. Amer. Nat., VI, 414 (1872).—E.
2. **P. carterensis** (Packard).
   P. cavernarum, var. carterensis Packard. Proc. Amer. Philos. Soc., XXI, 188 (1883).—Indiana, Kentucky.

V. SCOTHERPES Cope.

1. **S. bollmani** (McNeill).
   Trichopetalum bollmani McNeill. Proc. U. S. Nat. Mus., X, 330 (1887).—Indiana.
2. **S. copei** (Packard).
   Spirostrephon copei Packard. Amer. Nat., X, 748 (1871).
   Scoterpes copei Packard. Amer. Nat., XI, 414 (1872).—Kentucky.
3. **S. lunatus** Harger.
   Trichopetalum lunatum Harger. Amer. Jour. Sci., 3d ser. IV, 118 (1872).—NE.
4. **S. whitei** (Ryder).
   Zygonopus whitei Ryder. Proc. U. S. Nat. Mus., III, 527 (1880).
   Spirostrephon copei Packard. Amer. Nat., XV, 231 (1881).—Virginia.
5. **S. wyandotte** Bollman. Proc. U. S. Nat. Mus., XI, 405 (1888).—Indiana.

VI. STRIARIA Bollman.

1. **S. granulosa** Bollman. Ann. N. Y. Acad. Science, 1888, 108.—Tennessee.

Family POLYDESMIDÆ.

I. POLYDESMUS Latr.

1. **P. Branneri** Bollman. Proc. U. S. Nat. Mus., X, 620 (1887).—Tennessee.
2. **P. cavicola** Packard.* Bull. U. S. Geol. Survey (Hayden), III, 161 (1887).—Colorado.
3. **P. cerasinus** Wood. Proc. Phila. Acad., 1864, 6; Trans. Amer. Philos. Soc., XIII, 217 (1865).—Oregon.
4. **P. minor** Bollman. Entom. Amer., IV, 2 (1888).—Arkansas.
5. **P. moniliaris** Koch. Syst. d. Myriap., 135 (1847); Die Myriapoden, II, 20, t. LXIX, f. 143 (1863).
   P. serratus Wood. Trans. Amer. Philos. Soc., XIII, 215 (1865), not of *Say*.—E.
6. **P. nitidus** Bollman. Entom. Amer., III, 45 (1887).—Florida.
7. **P. pinetorum** Bollman. Entom. Amer., IV, 3 (1888).—Arkansas.
8. **P. serratus** Say. Jour. Phila. Acad., II, 106 (1821).
   P. canadensis Newport. Ann. and Mag. Nat. Hist., XIII, 265; Wood, Trans. Amer. Philos. Soc., XIII, 216 (1865).
   P. pennsylvanicus Koch. Syst. d. Myriap., 133 (1847); Die Myriapoden, II, 18, t. LXIX, f. 142 (1863).
   P. glaucescens Koch. Syst. d. Myriap., 133 (1847); Die Myriapoden, I, 59, t. XXVI, f. 56 (1863).—E.
9. **P. testi** Bollman. Proc. U. S. Nat. Mus., X, 619 (1887).—Indiana.

*The generic position of this species is uncertain [U.].

II. STRONGYLOSOMA Brandt.

1. **S. eruca** (Wood).
   Polydesmus eruca Wood. Proc. Phila. Acad., 1864, 8; Trans. Amer. Philos. Soc., XIII, 227 (1865).—Oregon.

III. LEPTODESMUS Saussure.*

1. **L. armatus** (Harger).
   Polydesmus armatus Harger. Amer. Jour. Science, 3d ser., IV, 118 (1872).—Oregon.
2. **L. haydenianus** (Wood).
   Polydesmus haydenianus Wood. Proc. Phila. Acad., 1864, 10; Trans. Amer. Philos. Soc., XIII, 226 (1865).—P.
3. **L. hispidipes** (Wood).
   Polydesmus hispidipes Wood. Proc. Philos. Acad., 1864, 7; Trans. Amer. Philos. Soc., XIII, 220 (1865).—Illinois.
4. **L. impurus** (Wood).
   Polydesmus impurus Wood. Proc. Phila. Acad., 1867, 43.—Texas.
5. **L. intaminatus** (Karsch).
   Polydesmus (*Oxyurus*) *intaminatus* Karsch. Archiv f. Naturgeschichte, 1881, 41.—California.
6. **L. placidus** (Wood).
   Polydesmus placidus Wood. Proc. Phila. Acad., 1864, 9; Trans. Amer. Philos. Soc., XIII, 225 (1865).
   P. floridus (var.?) Wood. Proc. Phila. Acad., 1864, 9; Trans. Amer. Philos. Soc., XIII, 226 (1865).—Michigan.
7. **L. varius** (McNeill).
   Polydesmus varius McNeill. Proc. U. S. Nat. Mus., X, 323 (1887).—Florida.
8. **L. vermiformis** (Saussure).†
   Polydesmus (*Strongylosoma*) *vermiformis* Sauss. Linnæa Entomologica, XIII, 326 (1859).—Texas.

IV. SCYTONOTUS Koch.

1. **S. cavernarum** Bollman Entom. Amer., III, 46 (1887).—Indiana.
2. **S. granulatus** (Say).
   Polydesmus granulatus Say. Jour. Phila. Acad., II, 107 (1821); Wood, Trans. Amer. Philos. Soc., XIII, 214 (1865).
   S. lævicollis Koch. Syst. d. Myriap., 131 (1847); Die Myriapoden, II, 41, t. LXXX, f. 163 (1863).
   S. scabricollis Koch. Syst. d. Myriap., 130 (1847); Die Myriapoden, II, 41, t. LXXX, 154 (1863).—NE.
3. **S. nodulosus** Koch. Syst. d. Myriap., 131 (1847); Die Myriapoden, II, 43, t. LXXX, f. 165 (1863).
   Polydesmus setiger Wood. Trans. Amer. Philos. Soc., XIII, 213 (1865).
   Stenonia hispida Sager. Proc. Phila. Acad., 1856, 109.—NE.

V. CHÆTASPIS Bollman.

1. **C. albus** Bollman. Entom. Amer., III, 46 (1887).—Indiana.

VI. PARADESMUS Saussure.

1. **P. dasys** Bollman. Proc. U. S. Nat. Mus., X, 619 (1887).—Maryland.

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* *Oxyurus* Koch, but this name is preoccupied by *Oxyurus* Raf. (Pisces), 1810, and *Oxyurus* Swains. (Aves), 1827.

†Reported from Dallas, Texas, by Karsch.

VII. EURYURUS Koch.

1. **E. erythropygus** Brandt. Recueil, 134 (1841).
   Polydesmus erythropygus Wood. Trans. Amer. Philos. Soc., XIII, 218 (1865).
   Polydesmus (*Paradesmus*) *carolinensis* Saussure. Linnæa Entomologica, XIII, 325 (1859).
   E. maculatus Koch. Syst. d. Myriap., 138 (1847); Die Myriapoden, I, 7, t. III, f. 8 (1863).—E.
2. **E. evides** (Bollman).
   Paradesmus evides Bollman. Entom. Amer., II, 229 (1887).
   E. evides Bollman. Entom. Amer., IV, 2 (1888).—Minnesota.

VIII. FONTARIA Gray.

1. **F. bifida** (Wood).
   Polydesmus bifidus Wood. Proc. Phila. Acad., 1864, 7; Trans. Amer. Philos. Soc., XIII, 223 (1865).—SE.
2. **F. bimaculata** (McNeill).
   Polydesmus bimaculatus McNeill. Proc. U. S. Nat. Mus., X, 323 (1887).—Florida.
3. **F. butleriana** Bollman. Proc. U. S. Nat. Mus., XI, 407 (1888).—Indiana.
4. **F. castanea** (McNeill).
   Polydesmus castaneus McNeill. Proc. U. S. Nat. Mus., X, 329 (1887).—Indiana.
5. **F. coriacea** Koch. Syst. d. Myriap., 141 (1847); Die Myriapoden, I, 72, t. XXXII, f. 63 (1863).
   Polydesmus corrugatus Wood. Proc. Phila. Acad., 1864, 6; Trans. Amer. Philos. Soc., XIII, 222 (1865).—NE.
6. **F. crassicutis** (Wood).
   Polydesmus crassicutis Wood. Proc. Phila. Acad., 1864, 7; Trans. Amer. Philos. Soc., XIII, 224 (1865).—Mississippi.
7. **F. dissecta** (Wood).
   Polydesmus dissectus Wood. Proc. Phila. Acad., 1867, 129.—California.
8. **F. evides** Bollman. Proc. U. S. Nat. Mus., X, 621 (1887).—Tennessee.
9. **F. furcifer** (Karsch).
   Polydesmus (*Fontaria*) *furcifer* Karsch. Archiv f. Naturgeschichte, 1884, 39.—California.
10. **F. georgiana** Bollman. Proc. U. S. Nat. Mus., XI, 344 (1888).—Georgia, Tennessee.
11. **F. indianæ** Bollman. Proc. U. S. Mus., XI, 406 (1888).—Indiana.
12. **F. montana** Bollman. Proc. U. S. Nat. Mus., X, 622 (1887).—Tennessee.
13. **F. oblonga** Koch. Syst. d. Myriap., 142 (1847); Die Myriapoden, I, 75, t. XXXII, f. 64 (1863).—Pennsylvania.
14. **F. pulchella** Bollman. Proc. U. S. Nat. Mus., XI, 316 (1888).—Tennessee.
15. **F. rileyi** Bollman. Proc. U. S. Nat. Mus., XI, 345 (1888).—Georgia.
16. **F. rubromarginata** Bollman. Proc. U. S. Nat. Mus., X, 622 (1887).—North Carolina.
17. **F. tallulah** Bollman. Proc. U. S. Nat. Mus., XI, 344 (1888).—Georgia.
18. **F. tennesseensis** Bollman. Proc. U. S. Nat. Mus., XI, 340 (1888).—Tennessee.
19. **F. trimaculata** (Wood).
   Polydesmus trimaculatus Wood. Proc. Phila. Acad. 6 1864, 6; Trans. Amer. Philos. Soc , XIII, 223 (1865).—NE.
20. **F. virginiensis** (Drury).
   Julus virginiensis Drury. Ins. Exot., I, t. XLIII, f. 8 (1770).
   Polydesmus virginiensis Pal. Beauv. Ins. Afr. et Amér. Aptères, pl. IV, fig. 5 (1805); Wood, Trans. Amer. Philos. Soc., XIII, 221 (1865).
   Polydesmus butleri McNeill. Bull. Brookville Soc. Nat. Hist., No. 3, 6 (1888).
   Fontaria virginiensis Gray, in Griffith's Animal Kingd. Ins., I, t. 135, fig. 1 (1832).—NE.

IX. SPHÆRIODESMUS Peters.

1. **S. pudicus** Bollman. Entom. Amer., IV, 3 (1888).—Arkansas.

Incertæ sedis.

Polydesmus leachii Gray, in Griffith's Animal Kingd., pl. CXXXV, 3 (no description).—"North America."

Polydesmus tridentatus (Fabr.).

Julus tridentatus Fabr. Spec. Ins., I, 350.

Polydesmus tridentatus Latreille, in Cuvier, Règne Animal, IV, 335; Gervais, Aptères, IV, 105.—"North America."

Suborder PSELAPHOGNATHA.

Family POLYXENIDÆ.

I. POLYXENUS Latr.

1. **P. fasciculatus** Say. Jour. Phila. Acad., II, 108 (1821); Wood, Trans. Amer. Philos. Soc., XIII, 228 (1865).—E.

Order PAUROPODA.

Family PAUROPODIDÆ.

I. PAUROPUS Lubbock.

1. **P. huxleyi** Lubbock. Trans. Linn. Soc. Lond., XXXVI, 182 (1867); Ryder, Amer. Nat., XII, 557 (1878); XIII, 611 (1879).—NE.
2. **P. lubbockii** Packard. Proc. Boston Soc. N. H., XIII, 409 (1870); Amer. Nat., IV, 621 (1870); Ryder, Amer. Nat., XIII, 611 (1879).—NE.

Family EURYPAUROPODIDÆ.

I. EURYPAUROPUS Ryder.

1. **E. spinosus** Ryder. Proc. Phila. Acad., 1879, 139, 164; Amer. Nat., XIII, 603 seq. (1879).—NE.

Order CHILOPODA.

Family GEOPHILIDÆ.

I. GEOPHILUS Leach.

1. **G. attenuatus** Say. Jour. Phila. Acad., II, 114 (1821).—SE.
2. **G. bipuncticeps** Wood. Jour. Phila. Acad., V, 45 (1862); Trans. Amer. Philos. Soc., XIII, 180 (1865).—Illinois.
3. **G. brevicornis** Wood. Jour. Phila. Acad., V, 45 (1862); Trans. Amer. Philos. Soc., XIII, 179 (1865).—Illinois, Texas.
4. **G. brunneus** McNeill. Proc. U. S. Nat. Mus., X, 331 (1867).—Indiana.
5. **G. californiensis** Bollman. Proc. U. S. Nat. Mus., X, 624 (1887).—California.
6. **G. foveatus** (McNeill).

   Mecistocephalus foveatus McNeill. Proc. U. S. Nat. Mus., X, 333 (1857).—Indiana.
7. **G. georgianus** Meinert. Proc. Amer. Philos. Soc., XXI, 219 (1885).—Georgia.
8. **G. glaber** Bollman. Entom. Amer., II, 229 (1887).—California.

9. **G. huronicus** Meinert. Proc. Amer. Philos. Soc., XXI, 220 (1885).—Massachusetts.
10. **G. indianæ** McNeill. Proc. U. S. Nat. Mus., X, 331 (1887).—Indiana.
11. **G. latro** Meinert. Myr. Musæi Haun. I, 79 (1871).—Louisiana.
12. **G. marginalis** Meinert. Proc. Amer. Philos. Soc., XXI, 218 (1885).—Florida.
13. **G. mordax** Meinert. Proc. Amer. Philos. Soc., XXI, 217 (1885).—"United States."
14. **G. occidentalis** Meinert. Proc. Amer. Philos. Soc., XXI, 220 (1885).—California.
15. **G. okolonæ** Bollman. Entom. Amer., IV, 5 (1888).—Arkansas.
16. **G. oweni** Bollman. Proc. U. S. Nat. Mus., X, 623 (1887).—Indiana.
17. **G. perforatus** (McNeill).
    Schendyla ? perforata McNeill. Proc. U. S. Nat. Mus., X, 325 (1887).—Florida.
18. **G. rubens** Say. Jour. Phila. Acad., II, 21 (1821).
    G. cephalicus Wood. Jour. Phila. Acad., V, 44 (1862).
    G. lævis Wood. Jour. Phila. Acad., V, 44 (1862).
    Strigamia rubens Wood. Trans. Amer. Philos. Soc., XIII, 182 (1865).—EP.
19. **G. salemensis** Bollman. Entom. Amer., III, 82 (1887).—Indiana.
20. **G. setiger** Bollman. Entom. Amer., III, 82 (1887).—Indiana.
21. **G. smithi** Bollman. Proc. U. S. Nat. Mus., XI, 347 (1888).—Washington, D. C.
22. **G. strigosus** (McNeill).
    Mecistocephalus strigosus McNeill. Proc. U. S. Nat. Mus., X, 332 (1887).—Indiana.
23. **G. umbraticus** (McNeill).
    Mecistocephalus umbraticus McNeill. Proc. U. S. Nat. Mus., X, 332 (1887).—E.
24. **G. urbicus** Meinert. Proc. Amer. Philos. Soc., XXI, 218 (1885).
    G. gracilis Harger.* Amer. Jour. Science, 3d series, IV, 117 (1872).—NE.
25. **G. varians** McNeill. Proc. U. S. Nat. Mus., X, 332 (1887).—Indiana.
26. **G. virginiensis** Bollman. Proc. U. S. Nat. Mus., XI, 346 (1888).—Virginia.

II. MECISTOCEPHALUS Newport.

1. **M. breviceps** Meinert. Proc. Amer. Philos. Soc., XXI, 214 (1885).—Massachusetts.
2. **M. fulvus** Wood. Jour. Phila. Acad., V, 41 (1862); Trans. Amer. Philos. Soc., XIII, 176 (1865).—Pennsylvania.
3. **M. limatus** Wood. Jour. Phila. Acad., V, 41 (1862); Trans. Amer. Philos. Soc., XIII, 177 (1865).—California.
4. **M. melanonotus** Wood. Jour. Phila. Acad. V, 41 (1862); Trans. Amer. Philos. Soc., XIII, 177 (1865).
5. **M. quadratus** Wood. Proc. Phila. Acad., 1867, 182.—California.

III. HIMANTARIUM Koch.

1. **H. cephalicum** (Wood).
    Strigamia cephalica Wood. Jour. Phila. Acad., V, 46 (1862); Trans. Amer. Philos. Soc., XIII, 187 (1865).—California.
2. **H. gracile** (Wood).
    Strigamia gracilis Wood. Proc. Phila. Acad., 1867, 128.—California.
3. **H. inerme** (Wood).
    Strigamia inermis Wood. Proc. Phila. Acad., 1867, 129.—California.
4. **H. laticeps** (Wood).
    Strigamia laticeps Wood. Jour. Phila. Acad., V, 49 (1862); Trans. Amer. Philos., Soc., XIII, 186 (1865).—Texas.
5. **H. tæniopse** (Wood).
    Strigamia tæniopsis Wood. Jour. Phila. Acad., V, 48 (1862); Trans. Amer. Philos. Soc., XIII, 185 (1865).—Georgia.

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* This yields to an earlier *G. gracilis* Meinert (1871).

IV. LINOTÆNIA Koch.*

1. **L. bidens** (Wood).
   Strigamia bidens Wood. Jour. Phila. Acad., v, 47 (1862); Trans. Amer. Philos. Soc., xiii, 183 (1865).—Pennsylvania.
2. **L. branneri** Bollman. Entom. Amer., iv, 4 (1888).—Arkansas.
3. **L. chionophila** (Wood).
   Strigamia chionophila Wood. Jour. Phila. Acad., v, 50 (1862); Trans. Amer., Philos. Soc., xiii, 189 (1865).
   Scolioplanes chionophilus Meinert. Proc. Amer. Philos. Soc., xxi, 223 (1885).—Minnesota.
4. **L. epileptica** (Wood).
   Strigamia epileptica Wood. Jour. Phila. Acad., v, 49 (1862); Trans. Amer., Philos. Soc., xiii, 188 (1865).—Oregon.
5. **L. fulva** (Sager).
   Strigamia fulva Sager. Proc. Phila. Acad., 1856, 109.
   S. bothriopus Wood. Jour. Phila. Acad., v, 47 (1862); Trans. Amer. Philos. Soc., xiii, 183 (1865).
   Scolioplanes bothriopus Meinert. Proc. Amer. Philos. Soc., xxi, 222 (1885).—E.
6. **L. gracilis** (Bollman).
   Scolioplanes gracilis Bollman. Ann. N. Y. Acad. Science, 1888, 110.—Tennessee.
7. **L. lævipes** (Wood).
   Strigamia lævipes Wood. Jour. Phila. Acad., v, 48 (1862); Trans. Amer. Philos. Soc., xiii, 184 (1865).—P.
8. **L. maculaticeps** (Wood).
   Strigamia maculaticeps Wood. Jour. Phila. Acad., v, 48 (1862); Trans. Amer. Philos. Soc., xiii, 186 (1865).—Texas.
9. **L. parviceps** (Wood).
   Strigamia parviceps Wood. Jour. Phila. Acad., v, 49 (1862); Trans. Amer. Philos. Soc., xiii, 187 (1865).
   Scolioplanes parviceps Meinert. Proc. Amer. Philos. Soc., xxi, 225 (1885). California.
10. **L. robusta** (Meinert).
    Scolioplanes robustus Meinert. Proc. Amer. Philos. Soc., xxi, 224 (1885).—"North America."
11. **L. ruber** (Bollman).
    Scolioplanes ruber Bollman. Amer. Nat., xxi, 81 (1887).—Indiana.
12. **L. walkeri** (Wood).
    Strigamia walkeri Wood. Trans. Amer. Philos. Soc., xiii, 184 (1865).—Pennsylvania.
13. **L. whitei** (Newport).
    Geophilus whitei Newport. Trans. Linn. Soc., xix, 436 (1845).
    Strigamia whitei Wood. Trans. Amer. Philos. Soc., xiii, 184 (1865).—NE.

V. CHOMATOBIUS Humb. et Sauss.

1. **C. mexicanus** (Sauss.).
   Geophilus mexicanus Saussure. Mem. Myriap. Mex., 132, t. vii, f. 49.
   Chomatobius mexicanus Humb. et Sauss. Études sur les Myriap., 145 (1872); Seliwanoff, Zapiski Imperat. Akademii Nauk., 24, t. ii, (1881).—California.

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* The synonymy of this genus is as follows:
  ?1843.—*Strigamia* Gray, in Todd's Cyclop. Anat. & Physiol., iii, 547.
  1847.—*Stenònia* Koch. Syst. d. Myriap., 85 (in part).
  1847.—*Linotænia* Koch. Syst. d. Myriap., 86.
  1866.—Scolioplanes Bergsöe and Meinert. Nat. Tidsskr., iv, 98.

Family SCOLOPENDRIDÆ.

I. SCOLOPENDRA L.

1. **S. crudelis** Koch. Syst. der Myr. 170 (1847); Die Myriapoden II, 36, t. LXVII-LXXVIII (1863).
   S. longipes Wood. Jour. Phila. Acad., V, 26 (1862).—Florida.
2. **S. dehaanii** Brandt. Recueil, 59 (1841).
   S. bispinipes Wood. Jour. Phila. Acad., V, 28 (1862); Trans. Amer. Philos. Soc., XIII, 166 (1865).—California.
3. **S. heros** Girard, in Marcy's Exp. Red River, App. F, 243 (1853); Wood, Jour. Phila. Acad., V, 18 (1862); Trans. Amer. Philos. Soc., XIII, 155 (1865).
   S. castaneiceps Wood. Proc. Phila. Acad., 1861, 11.
   S. copeiana Wood. Jour. Phila. Acad., V, 27 (1862).
   S. polymorpha Wood. Proc. Phila. Acad., 1861, 11.—SW.
4. **S. inæquidens** Gervais. Aptères IV, 277 (1847).—New York.
5. **S. morsitans** L. Syst. Nat. I, 1063; Wood, Trans. Amer. Philos. Soc., XIII, 161 (1865).
   S. marginata Say. Jour. Phila. Acad., II, 100 (1821).—E. W. P.
6. **S. pachypus** Kohlrausch. Beiträge z. Kennt. d. Scolopendriden, 25 (1878); Archiv f. Naturgeschichte, 1881, 113.—California.
7. **S. pernix** Kohlrausch. Beiträge z. Kennt. d. Scolopendriden, 25 (1878); Archiv f. Naturgeschichte, 1881, 115.—"North America."
8. **S. subspinipes** Leach. Trans. Linn. Soc., XI, 383.
   S. byssina Wood. Proc. Phila. Acad., 1861, 10; Jour. Phila. Acad., V, 26 (1862); Trans. Amer. Philos. Soc., XIII, 164 (1865).—SP.
9. **S. viridis** Say. Proc. Phila. Acad. II, 110 (1821); Wood, Jour. Phila. Acad., V, 22 (1862); Trans. Amer. Philos. Soc., XIII, 159 (1865).
   S. parva Wood. Proc. Phila. Acad., 1861, 10.
   S. punctiventris Newp. Ann. and Mag. Nat. Hist., XIII, 100.—SE.
10. **S. woodii** Meinert. Proc. Amer. Philos. Soc., XXI, 198 (1885).
    S. inæquidens Wood. Jour. Phila. Acad., V, 26 (1862); Trans. Amer. Philos. Soc., XIII, 162 (1865).—SE.

II. RHYSIDA Wood.*

1. **R. celer** (Humb. et Sauss.).
   Branchiostoma celer Humbert et Saussure. Rev. et Mag. Zool., 1870, 202; Études Myriap., 122, t. VI, f. 16 (1872).—SE.

III. CRYPTOPS Leach.

1. **C. hyalinus** Say. Jour. Phila. Acad., II, 111 (1821).
   †*C. milberti* Gervais. Aptéres, IV, 592 (1847).
   C. asperipes Wood. Proc. Phila. Acad., 1867, 129.
   C. sulcatus Meinert. Proc. Amer. Philos. Soc., XXI, 211 (1885).—E.

IV. THEATOPS Newport.

1. **T. crassipes** (Meinert).†
   Opisthemega crassipes Meinert. Proc. Amer. Philos. Soc., XXI, 209 (1885).—SE.

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* *Branchiostoma* (Newport, 1844), being preoccupied, the above name, suggested by Dr. Wood in 1862, must be employed.

†Pocock, Ann. and Mag. Nat. Hist., 1888, 289, refers this species to *T. posticus*.—[U.]

2. **T. postica** (Say).
   Cryptops postica Say. Jour. Phila. Acad., II, 111 (1821).
   Theatops postica Newport. Trans. Linn. Soc. XIX, 411 (1844); Pocock, Ann. and Mag. Nat. Hist., 1888, 289.
   Opisthemega postica Wood. Jour. Phila. Acad., V, 35 (1862); Trans. Amer. Philos. Soc., XIII, 179 (1865).—E.
3. **T. spinicauda** (Wood).
   Opisthemega spinicauda Wood. Jour. Phila. Acad., V, 36 (1862); Trans. Amer. Philos. Soc., XIII, 170 (1865).—E.

V. SCOLOPOCRYPTOPS Newport.

1. **S. gracilis** Wood. Jour. Phila. Acad V, 38 (1862); Trans. Amer. Philos. Soc., XIII, 173 (1865).
   S. lanatipes Wood. Jour. Phila. Acad., V, 39 (1862); Trans. Amer. Philos. Soc., XIII, 175 (1865).
   S. californica Humb. et Sauss. Rev. et Mag. Zool., 1870, 204.—California.
2. **S. miersii** *Newport.* Trans. Linn. Soc., XIX, 405 (1844).—California.*
3. **S. nigridius** McNeill. Proc. U. S. Nat. Mus., X, 333 (1887).—E.
4. **S. sexspinosus** (Say).
   Cryptops sexspinosa Say. Jour. Phila. Acad., II, 112 (1821).
   Scolopocryptops sexspinosus Newport. Trans. Linn. Soc., XIX, 407 (1844); Wood, Trans. Amer. Philos. Soc., XIII, 172 (1865).
   S. georgicus Meinert. Proc. Amer. Philos. Soc., XXI, 180 (1885).
   S. spinicauda Wood. Jour. Phila. Acad., V, 39 (1862); Trans. Amer. Philos. Soc., XIII, 174 (1865).
   Scolopendropsis helvola Koch. Syst. d. Myriap., 175 (1847); Die Myriapoden, II, 34, t. LXXVI, f. 156 (1862).—EP.

Family LITHOBIIDÆ.

I. LITHOBIUS Leach.

§ ARCHILITHOBIUS Stuxberg.

1. **L. bilabiatus** Wood. Proc. Phila. Acad., 1867, 130.—NE.
2. **L. bipunctatus** (Wood).
   Bothropolys bipunctatus Wood. Jour. Phila. Acad., V, 16 (1862); Trans. Amer. Philos. Soc., XIII, 153 (1865).—P.
   L. bipunctatus Stuxberg. Ofvers af Kgl. Vet.-Akad. Förhandl., 1875, No. 3. 30.
3. **L. branneri** Bollman. Ann. N. Y. Acad. Sci., 1888, 107.—Tennessee.
4. **L. cæcus** Bollman. Ann. N. Y. Acad. Sci., 1888, 111.—Tennessee.
5. **L. cardinalis** Bollman. Amer. Nat., XXI, 81 (1887).—Indiana.
6. **L. eigenmanni** Bollman. Proc. U. S. Nat. Mus., X, 625 (1887).—British Columbia.
7. **L. elattus** Bollman. Proc. U. S. Nat. Mus., XI, 348 (1888).—Virginia.
8. **L. exiguus** Meinert. Myr. Musæi Haun., III, 110 (1886).—New York.
9. **L. holzingeri** Bollman. Entom. Amer., III, 83 (1887).—Minnesota.
10. **L. jowensis** Meinert. Proc. Amer. Philos. Soc., XXI, 177 (1885).—NE.
11. **L. kochii** Stuxberg. Ofvers. af Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 68; No. 3, 30.—California.
12. **L. lundii** Meinert. Myr. Musæi Haun., III, 111 (1886).—New York.
13. **L. minnesotæ** Bollman. Amer. Nat., XXI, 81 (1887).—Minnesota.
14. **L. monticola** Stuxberg. Ofvers. af Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 65; No. 3, 30.—California.

* Kohlrausch has recorded one from California.

15. **L. obesus** Stuxberg. Ofvers. af Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 67; No. 3, 31.—California.
16. **L. paradoxus** Stuxberg. Ofvers. af Kgl. Vet-Akad. Förhandl., 1875, No. 2, 67; No. 3, 31.—California.
17. **L. pinguis** Bollman. Entom. Amer., IV, 7 (1888).—Arkansas.
18. **L. proridens** Bollman. Amer. Nat., XXI, 81 (1887).—NE.
19. **L. pullus** Bollman. Amer. Nat., XXI 81 (1887).—NE.
20. **L. pusio** Stuxberg. Ofvers. af. Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 66; No. 3, 30.—California.
21. **L. similis** Bollman. Ann. N. Y. Acad. Sci., 1887, 112.—Tennessee.
22. **L. trilobus** Bollman. Amer. Nat., XXI, 81 (1887).—Indiana.

§ HEMILITHOBIUS Stuxberg.

23. **L. cantabrigensis** Meinert. Proc. Amer. Philos. Soc., XXI, 177 (1885).—Massachusetts.
24. **L. eucnemis** Stuxberg. Ofvers. af Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 70; No. 3, 30.—New York.

§ PSEUDOLITHOBIUS Stuxberg.

25. **L. megaloporus** Stuxberg. Ofvers af Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 69; No. 3, 29.—California.

§ LITHOBIUS Leach, s. str.

26. **L. atkinsoni** Bollman. Proc. U. S. Nat. Mus., X, 625 (1887).—North Carolina
27. **L. aureus** McNeill. Proc. U. S. Nat. Mus., X, 327 (1887).—Florida.
28. **L. aztecus** Humb. et Sauss. Rev. et Mag. de Zool., 1869, 156; Études sur les. Myriap. 116 (1872).—Mexico (P.?).*
29. **L. celer** Bollman. Entom. Amer. IV, 7 (1888).—Arkansas.
30. **L. forficatus** (L.).
    Scolopendra forficata Linnæus. Syst. Nat. I, 638 (1758).
    L. forficatus Leach. Trans. Linn. Soc. XI (1815).
    L. spinipes Say. Jour. Phila. Acad. II, 108 (1821).
    L. americanus Newp. Trans. Linn. Soc. XIX, 365 (1845); Wood, Jour. Phila. Acad. XIII, 148 (1865).—E., B.
31. **L. howei** Bollman. Amer. Nat. XXI, 81 (1887).—Minnesota.
32. **L. œdipes** Bollman. Entom. Amer. IV, 8 (1888).—Arkansas.
33. **L. paucidens** Wood. Jour. Phila. Acad. V, 14 (1862); Trans. Amer. Philos. Soc. XIII, 151 (1865).—P.
34. **L. pinetorum** Harger. Amer. Jour. Sci. 3d ser. IV, 116 (1872).—Oregon.
35. **L. planus** Newport. Linn. Trans. XIX, 366 (1845); Wood, Trans. Amer. Philos. Soc. XIII, 151 (1865).—B?
36. **L. xanti** (Wood).
    Bothropolus xanti Wood. Jour. Phila. Acad., V, 15 (1862); Trans. Amer. Philos. Soc. XIII, 152 (1865).
    L. xanti Stuxberg. Ofvers. af Kgl. Vet.-Akad. Förhandl., 1875, No. 3, 27.

§ NEOLITHOBIUS Stuxberg.

37. **L. clarus** McNeill. Proc. U. S. Nat. Mus., X, 326 (1887).—Florida.
38. **L. juventus** Bollman. Proc. U. S. Nat. Mus., X, (1887).—Indiana.
39. **L. latzelii** Meinert. Proc. Amer. Philos. Soc., XXI, 175 (1885).—Virginia.
40. **L. mordax** L. Koch. Die Myriapodengattung Lithobius, 34 (1862).—Louisiana.

*No. 28 is doubtfully within our limits. It was included in Bollman's list without note or comment.—[U.]

41. L. transmarinus L. Koch. Die Myriapodengattung Lithobius, 31 (1862).—Louisiana.

42. L. tyrannus Bollman. Proc. U. S. Nat. Mus., x, 626 (1887).—Indiana.

43. L. underwoodi Bollman. Proc. U. S. Nat. Mus., xi, 350 (1888).—Georgia.

44. L. vorax Meinert. Myr. Musæi Haun., ii, 292 (1872).—Louisiana.

45. L. xenopus Bollman. Proc. U. S. Nat. Mus., xi. 350 (1888).—Georgia.

§ EULITHOBIUS Stuxberg.

46. L. multidentatus Newport. Linn. Trans., xix, 365 (1845).
Bothrypolys nobilis Wood. Jour. Phila. Acad., v, 15 (1862).
B. multidentatus Wood. Trans. Amer. Philos. Soc., xiii, 152 (1865).—NE.

47. L. rex Bollman. Proc. U. S. Nat. Mus., xi, 350 (1888).—Georgia.

II. HENICOPS Newport.

1. H. fulvicornis (Meinert).
Lamyctes fulvicornis Meinert. Naturhistorisk Tidsskrift, 3rd R., v, 267 (1872); Stuxberg, Ofvers. af Kgl. Vet.-Akad. Förhandl., 1875, No. 2, 72; No. 3, 31.
Henicops fulvicornis Latzel. Die Myriap. der Oest.-Ung. Monarchie, i, 133 (1881).—New York, Arkansas.

Family SCUTIGERIDÆ.

I. SCUTIGERA Latr.

1. S. forceps (Raf.).
Selista forceps Raf. Ann. of Nature, No. 1, 7 (1820).
Cermatia coleoptrata Say. Jour. Phila. Acad., ii, 5 (1821).
C. floridana Newport. Trans. Linn. Soc., xix, 353 (1845).
C. forceps Wood. Jour. Phila. Acad., v, 9 (1862); Trans. Amer. Philos. Soc. xiii, 145 (1865).—E.

2. S. linceci (Wood).
Cermatia linceci Wood. Proc. Phila. Acad., 1867, 42.—Texas.

Summary.

	Genera.	*Species.*
DIPLOPODA.		
Family Polyzonidæ	4	5
Family Julidæ	8	42
Family Lysiopetalidæ	1	3
Family Craspedosomidæ	5	15
Family Polydesmidæ	9	49
Family Polyxenidæ	1	1
	28	115
PAUROPODA.		
Family Pauropodidæ	1	2
Family Eurypauropodidæ	1	1
	2	3
CHILOPODA.		
Family Geophilidæ	5	50
Family Scolopendridæ	5	19
Family Lithobiidæ	2	48
Family Scutigeridæ	1	2
	13	119
Total	43	237

SOME NEW SPECIES OF NORTH AMERICAN MYRIAPODS.*

By Charles Harvey Bollman.

The following new species are described from specimens in the museum of the Indiana University and my own collection. Six of these are from Bloomington, Indiana, thus making 18 new species which have been described from that locality. Three others were found in a very small collection made at Fort Snelling, Minnesota.

The types of the new species are in the museum of the Indiana University and specimens of *Scolioplanes ruber* and *Lithobius cardinalis*, *proridens*, and *pullus* have been sent to Dr. Anton Stuxberg, of Gothenburg, Sweden.

1. Julus burkei.

[*Julus burkei* Bollman. Amer. Nat., xxi, 82 (1887).
Nannolene burkei Bollman. Entom. Amer., ii, 225 (1887); Ann. N. Y. Acad. Sci., iv, 40 (1887).]

Light yellowish-brown, with darker shadings, a row of black spots along each side, feet and antennæ paler. Slender, wrinkled like leather. Vertex with a slender, median sulcus, no foveolæ, wrinked like the back. Antennæ crasse-clavate, the last joints rather densely pilose, about equaling the breadth of body. Ocelli arranged in a triangular form, in three or four series, about 18, inconspicuous, the upper not filled out, a few covered by the first dorsal scuta. Segments 45–47; the first segment large, semicircular, the posterior angle barely rounded, sides striate; other segments moderately striate, the posterior margin with a row of hairs. Repugnatorial opening conspicuous, not touching the transverse line or forming a bend in it. Anal segment rounded, not projecting beyond the anal valves; anal valves with a few hairs, marginate; anal scales distinct, rounded. Pairs of feet 70–72, moderately long and slender. Length of body, 14^{mm}.

Habitat.—Ukiah, California (James H. Burke).

There are two specimens in the museum of the Indiana University, which were labeled *J. hortensis*.

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*This paper was found among the effects of the late Charles H. Bollman. It contains full descriptions of ten new forms of Myriapods. Brief diagnoses of nine of these species have already been published in the American Naturalist, Volume xxi, pp. 81, 82 (January, 1887). *Scolopocryptops calcaratus* has not been before described It seems desirable that these fuller descriptions should be published in order to enable future students of the subject to more certainly identify the species.—Lucien M. Underwood.

2. Julus ellipticus.

[*Julus ellipticus* Bollman. Am. Nat., XXI, 82 (1887).
Parajulus ellipticus Bollman. Ann. N. Y. Acad. Sci., IV, 35 (1887).]

Chesnut, marked with lighter and darker; a black median line, a row of spots on each side, antennæ dark brown, feet pale. Rather robust, attenuated before, but only slightly behind, not smooth. Vertex with a very slight median sulcus, no foveolæ, a little roughened. Antennæ filiform, moderately pilose, not equaling the breadth of body. Ocelli arranged in an elliptical form, in seven series, rather small, 45–48. Segments 46–47; the first broadly rounded and produced before, straight behind, angles rounded, sides striate, other segments moderately striate beneath, those of the præscuta very oblique, being nearly straight up and down, while the others are but slightly oblique. Repugnatorial opening small, situated near the anterior border, transverse line bending before it. Anal segment with a long, robust spine, which projects beyond the anal valves; anal valves not pilose, scarcely marginate; anal scale short, broadly rounded. Pairs of feet 75–80, rather long. Length of body 25mm.

Habitat.—Fort Snelling, Minnesota (W. D. Howe).

I have two females in my private collection.

3. Fontaria virginiensis castanea.

[*Fontaria virginiensis castanea* Bollman. Am. Nat., XXI, 82 (1887).]

Chesnut-brown, lateral laminæ and the borders of the first segment yellow, an indistinct, black dorsal line; feet and under parts pale. Segments more rugose than in *virginiensis;* last segment blunt, with a few long hairs. Spine of the trochanter longer and sharper. Antennæ and feet more densely pilose. Length of body 25mm.

Habitat.—Fort Snelling, Minnesota (W. D. Howe).

I have one male in my collection.

4. Scolioplanes ruber.

[*Scolioplanes ruber* Bollman. Amer. Nat., XXI, 81 (1887).]

Rather robust, attenuated anteriorly and posteriorly, the attenuation most marked before; in life bright red, the posterior two thirds and the feet darkest; in alcohol fulvous, the head and mouth parts brown; sparsely hirsute, feet not so decidedly. Prehensorial feet barely extending beyond the cephalic margin of the head, sparsely hirsute, with moderately long hairs; sternum cordiform, wider than long (6:4); coxa unarmed; the tooth blunt, short. Cephalic lamina longer than wide (7:5), sparsely hirsute, rather smooth, sides scarcely rounded; lamina basalis (6:2.5); lamina prebasalis concealed; lamina frontalis present. Antennæ moderately long, rather slender; all the joints except the first, antepenult, and penult moderately long. Laminæ ventrales with a large, shallow, median foveolæ, a smaller one on each side; pores more numerous on the posterior half of the plates. First pair

of feet shorter than the second, posterior scarcely longer than the anterior. Posterior coxæ slightly inflated; pores moderate in numbers, large and small; last ventral lamina narrow; sides straight, converging. Last pair of feet not much longer than the first, crassate in the male, in the female somewhat enlarged; spine small. Pairs of feet in the male 67–69, in the female 71–73. Length of body 53^{mm}; breadth 2^{mm}.

Habitat.—Bloomington, Indiana.

This species is described from 12 specimens, and is not uncommon. It has the habits of the other members of this genus.

5. Scolopocryptops calcaratus, sp. nov.

Head fulvous, body green, the last two segments the same color as the head, feet lighter than the body, antennæ dull green, the last few joints fulvous. Antennæ moderately long, joints 17, minutely and densely hirsute, last joint rather long. Body not robust, depressed, rather wide, sparsely and shortly hirsute. Prehensorial feet with the spine rather large and slender; sternum a little produced, the anterior margin nearly straight; coxa with a single short, blunt tooth. Anal feet moderate, the last three joints rather densely and minutely hirsute, the rest sparsely; inferior spine large, strong, and sharp; interior small and sharp. Posterior coxæ scabrous, pores numerous; spine moderate, sharp. Last ventral lamina wide, narrowed posteriorly; the tip rounded, side nearly straight. Length of body 33^{mm}; breadth 4^{mm}.

Habitat.—Bloomington, Indiana.

This species is described from one specimen, which was found under leaves in a heavily wooded tract.

6. Lithobius howei.

[*Lithobius howei* Bollman. Amer. Nat., XXI, 81 (1887).]

Brown, head dark, ventral laminæ and feet paler; robust, nearly smooth; feet sparsely pilose; cephalic lamina subquadrate, of about equal length and breadth. Antennæ moderate, joints 20, rather large, moderately pilose. Ocelli about 20, in six series. Prosternal teeth 6, moderate. Coxæ pores $\frac{5,5,5,4}{5,5,6,5}$, round. First pair of feet armed with 0,2 spines; penultimate lost; last 1,3,3,1. Last pair of feet moderate. Length of body, 15^{mm}; breadth, 2.5^{mm}.

Habitat.—Fort Snelling, Minnesota.

This species belongs to the subgenus *Lithobius*. It is described from one specimen taken by Mr. Walter D. Howe.

7. Lithobius proridens.

[*Lithobius proridens* Bollman. Am. Nat., XXI, 81 (1887).]

Yellowish-brown of varying shades, head darkest, ventral laminæ, feet and antennæ light; slender, smooth, feet and sometimes the last ventral laminæ moderately pilose; cephalic laminæ subcordate, broader

than long (8:7). Antennæ moderate, joints 25–29, joints short, rather densely hirsute. Ocelli 9–12, in 4 or 5 series. Prosternal teeth 10 or 12, rather small and not sharp. Coxæ pores 4,5,5,4 or 3,4,4,3, round. Spines of the first pair of feet 2,2,1; penultimate pair 1,3,3,2 or 1,3,2,1; last pair 1,3,3,2 or 1,3,3,1. Posterior feet moderate. Claw of the female genitalia whole, rather long and slender; spines rather long and slender, of about equal length. Length of body, 13mm; breadth, 1.8mm.

Habitat.—Bloomington, Indiana.

This species is common under leaves on wooded hillsides; it belongs to the subgenus *Archilithobius.*

8. Lithobius cardinalis.

[*Lithobius cardinalis* Bollman. Am. Nat., XXI, 81 (1887).]

Brown, ventral laminæ and feet paler; head fulvous brown, antennæ darkest, tip rufous; rather slender, smooth, very sparsely pilose, feet sparsely; cephalic laminæ subcircular, wider than long (7:6); antennæ moderate, joints 28, small, rather densely hirsute throughout; ocelli 10, in 4 or 5 series; prosternal teeth 4, rather large; coxæ pores 3,4,4,3, round; spines of the first pair of feet 0,2,1; penultimate 1,3,3,1; last 1,3,3,1; posterior feet rather long; claw of the female genitalia tripartite, short and stout; spines robust, sharp, interior shortest. Length of body, 8mm; breadth, 1mm.

Habitat—Bloomington, Indiana.

This species is common; I have taken it most abundantly under boards laid on a thick growth of grass in March and April. It belongs to the subgenus *Archilithobius.*

9. Lithobius pullus.

[*Lithobius pullus* Bollman. Am. Nat., XXI, 81 (1887).]

Brown, head darkest, feet and ventral laminæ paler; feet sparsely hirsute; cephalic lamina subquadrate, longer than wide (11:10). Antennæ moderate, joints 20, not very short, moderately pilose. Ocelli 9–12, in four series. Prosternal teeth 4, moderate. Coxæ pores 3,4, 4,3, round. Spines of the first pair of legs 1,2,1; penultimate 1,3,2,1; last 1,3,3,1. Posterior feet moderate. Claw of the female genitalia tripartite, the inner lobe larger than the other, spines rather robust, sharp, the inner smallest; in one specimen there are three on one side. Length of body, 10mm; breadth, 1mm.

Habitat.—Bloomington, Indiana.

This species belongs to the subgenus *Archilithobius*, and is described from nine specimens.

10. Lithobius trilobus.

[*Lithobius trilobus* Bollman. Am. Nat., XXI, 81 (1887).]

Brown, head light mahogany, feet and ventral laminæ pale; feet sparsely pilose and also the last ventral laminæ, cephalic lamina subcordate, broader than long (7:6). Antennæ moderate, joints 20, mostly

short, moderately pilose. Ocelli 18–23, in six slightly oblique series. Prosternal teeth 4, moderate. Coxal pores, 3,4,4,3, round. Spines of the first pair of feet 1,3,1; penultimate 1,3,2,1; last pair 1,3,1, the fifth joint on each side produced into a short, rounded lobe at the apex and armed with a few spines in the male, as in *Lithobius nordenskiöldii.** Posterior feet moderately long. Length, 13^{mm}; breadth, 1^{mm}.

Habitat.—Bloomington, Indiana.

This species belongs to the same subgenus as the preceding, and is described from two females and one male.

* I have found two male *L. bilabiatus*, which have the posterior legs, as described by Wood.

NOTES ON THE SYNONYMY OF THE MYRIAPODA.*

By CHARLES HARVEY BOLLMAN.

1. POLYZONIINÆ.

1841.—*Omatophora* Brandt. Recueil, 49.
1872.—*Platydesmiens.* Miss. Scientif. Mex., Zool., VI, 199.
1884.—*Platydesmia* (Sauss. (?)) Latzel. Myr. Öst. Ungar. Monarch., II, 356.

Placing *Siphonophora* and its allies in a separate subfamily leaves the remaining genera as a similar group to which we must give the name POLYZONIINÆ, because it contains the type of the family *Polyzoniidæ.*

2. SIPHONOPHORINÆ.

1840.—*Typhlogena* Brandt. Recueil, 50.
1844.—*Siphonophoridæ* Newport. Trans. Linn. Soc., 278.
1869.—*Androgna thidæ* Cope. Proc. Amer. Philos. Soc., 182.
1884.—*Dolistenia* Latzel. Myr. Öst. Ungar. Monarch., II, 362.

Many writers have seen fit to detach *Siphonophora* from related genera, and to make of it a separate family or subfamily. As no characters of importance exist except those drawn from the form of body, it seems best, therefore, to give it the rank of a subfamily only.

To place *Androgna thus* Cope in this subfamily makes the number of segments valueless as a subfamily character.

3. ANDROGNATHUS.

1869.—*Androgna thus* Cope. Proc. Amer. Philos. Soc., 182 (*corticarius*).
1875.—*Dolistenus* Fanzago. Atti Soc. Ven. Trent. Sci. Nat., 62 (*savii*).
1884.—*Dolichostenus* Latzel. Myr. Öst. Ungar. Monarch., II, 68 (emendation).
1884.—*Dolystenus* Berlese. Acari, Myr. & Scorp. Ital., Fas. XII, No. 2 (emendation).

A careful comparison of *Androgna thus* and *Dolistenus* has shown that the two genera are inseparable, and the latter must stand as a synonym of *Androgna thus.*

Dr. Berlese has used his emendation of *Dolistenus* in all his works, while Dr. Latzel's only occurred in a foot-note, and was intended to show how *Dolistenus* should be spelled according to its derivation.

4. POLYZONIUM.

1834.—*Polyzonium* Brandt. Oken's Isis, 704 (*germanicum*).
1836.—*Platyulus* Gervais. Bull. Soc. Phil. Paris, 71 (*audouini=germanicum*).
1839.—*Leiosoma* Victor. Bull. Nat. Moscow, 44, pl. 1 (*rosea=?germanicum*).

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* This paper was found among Mr. Bollman's manuscripts. Though fragmentary in character, it is believed to contain matter of sufficient importance to warrant publication.—[L. M. U.]

1870.—*Petaserpes* Cope. Trans. Amer. Ent. Soc., 65 (*rosalbus*).
1880.—*Hirudisoma* Fanzago. Bull. Soc. Ent. Ital., 276 (*pallidum*).
1887.—*Hexaglena* McNeill. Proc. U. S. Nat. Mus., 328 (*cryptocephala=rosalbum*).

From the above synonymy it can be seen that I have united the American genera *Petaserpes* and *Hexaglena* with the European genus *Polyzonium*.

Concerning *Petaserpes* I wish to call attention to the following sentence in Dr. Cope's diagnosis: "Annulæ without lateral processes, each with two pores, forming two rows on each side of the body."

The first part implies that each annula has two pores, but his next phrase that each has *four* instead of *two*.

This obscurity of statement led Mr. McNeill to form his *Hexaglena*, which has only one row of foramina repugnatoria on each side of the body, as was no doubt the case in Dr. Cope's specimens.

5. OCTOGLENA.

1864.—*Octoglena* Wood. Proc. Phila. Acad. Nat. Sci., 186 (*bivirgata*).

I have never seen a specimen belonging to this genus, but as it is somewhat of a stumbling block, I call attention to the following points:

Judging from Dr. Wood's figures and some remarks by Dr. Cope, it seems to me that *Octoglena* is closely related to *Polyzonium*, but that it differs in having the first dorsal plate not produced to the base of the antennæ, and the body much narrower than in *Polyzonium*.

6. PLATYDESMUS.

1843.—*Platydesmus* Lucas. Ann. Soc. Ent. France, 51 (*polydesmoides*).
1849.—*Piestodesmus* Lucas. Rev. et. Mag. Zool., 589 (*moreleti*).
1864.—*Brachycybe* Wood. Proc. Phil. Acad. Nat. Sci., 187 (*lecontei*).

The above nominal genera seem to agree in the shape of body, markings of segments, and structure of mouth parts, while the number of ocelli varies. Platydesmus has one, Piestodesmus has two, and Brachycybe has none, but until all these points can be verified it is not safe to form subgenera on this character.

7. STEMMIULUS.

1844.—*Stemmiulus* Gervais. Ann. Soc. Ent. France, 28 (*bioculatus*).
1881.—*Stemmijulus* Karsch. Neue Jul. Ber. Mus., als Prod. Jul. Monograph., II (emend.).

This genus has been ranked by Dr. Latzel as only a subgenus of *Julus*, but on account of the peculiar number of ocelli I believe it ought to be given a full generic rank, at least until more can be ascertained about the structure of the mouth parts.

The original orthography of Gervais should be employed.

8. JULUS.

1758.—*Julus* Linné.
——.—*Julus*, of most authors.
1847.—*Allajulus* Koch, Syst. Myr., 46 and 106 (*punctatus*, etc.).
1883.—*Pachyiulus* Berlese. Acari, Myr. Scorp. ital., Fasc. VIII, No. 1 (*varius* and *sabulosus*).
1883.—*Diploiulus* * Berlese. Acari, Myr. Scorp. ital., Fasc. VIII, No. 1 (*terrestris* and *dalmaticus*).
1884.—*Julus* Berlese. Acari, Myr. Scorp. ital., Fasc. XII (*sabulosus*).
1884.—*Ophyiulus* Berlese. Acari, Myr. Scorp. ital., Fasc. XII (*terrestris*).
1884.—*Brachyulus* and *Brachyiulus* Berlese. Acari, Myr. Scorp., ital., Fasc. XII (*dalmaticus*).
1884.—*Typhloiulus* Latzel. Myr. Öst. Ungar. Monarch., II, 260 (*psilonotus*).
1884.—*Allaiulus* Latzel. Myr. Öst. Ungar. Monarch., II, 264 (*nanus;* emendation).
1884.—*Ommatoiulus* Latzel. Myr. Öst. Ungar. Monarch., II, 277 (*fœtidus*).
1886.—*Tiphloiulus* Berlese. Jul. Mus. Firenze, 91 (emendation).
1886.—*Pachiulus* Berlese. Jul. Mus. Firenze, 29 (emendation; *varius*).
1886.—*Archiulus* Berlese. Jul. Mus. Firenze, 44 (*sabulosus*).
1886.—*Brachiulus* Berlese. Jul. Mus. Firenze, 90 (emendation; *pusillus*).
1886.—*Ophiulus* Berlese. Jul. Mus. Firenze, 63 (emendation; *fallax*).

I wish to call attention here to the subgenera of *Julus*. I do not believe that Latzel's subgenera based on the characters of the ocelli ought to be adopted, because this character is subject to considerable variation. It will probably be best to retain those estsblished by Berlese in his "*Julidi del Museo di Firenze*," except that the following changes must be made: *Archiulus* must give way to a subgenus *Julus*, because this division contains the type of *Julus*. The following orthography should be used: *Pachyiulus*, *Ophyiulus*, *Brachyiulus* (*Brachyulus*), and *Typhloiulus*, in place of that used in the above pamphlet.

9. NEMASOMA.

1847.—*Nemasoma* Koch. Syst. Myr., 47 and 116 (*varicorne*).
1851.—*Isobates* Menge. Neu. Schrift. naturf. Gesellsch. Danz., IV, 6 (*semisulcatus*).

The name *Isobates* has always been used by European authors, because *Nemasoma* Koch was said to be preoccupied by one of Latreille's genera.

I find from Agassiz's Nomenclator that Latreille's genus is spelled *Nemosoma*, a word sufficiently different from *Nemasoma*.

Although this is a small difference between the two genera, nevertheless *Nemasoma* must be used in place of *Isobates*.

10. PARAJULUS.

1869.—*Parajulus* Humbert & Saussure. Rev. et Mag. Zool., 155 (*olmecus*).
1884.—*Paraiulus* Latzel. Myr. Öst.-Ungar. Monarch., 55 (emendation).
1887.—*Pseudojulus* Bollman. Ent. Amer., 226 (*obtectus*).

I have ascertained that my subgenus *Pseudojulus*, which was based upon the characters of a male, represents only a certain stage of development, and must be considered as a true synonym of *Parajulus*.

1884.—Diploiulus Berlese. Acari, Myr. Scorp. ital., Fasc. XII (rufifrons and latzelii).

11. SPIROSTREPTUS.

1833.—*Spirostreptus* Brandt. Bull. Soc. imp. Nat. Moscou, 203 (*sebae* and *audouini*).
1833.—*Spirocyclistus* Brandt. Bull. Soc. imp. Nat. Moscou, 204 (*acutangulus*).
1833.—*Spiropœus* Brandt. Bull. Soc. imp. Nat. Moscou, 204 (*fischeri*).
1841.—*Nodopyge* Brandt. Recueil 91 (*jaranicus, sebae, audouini, etc.*).
1841.—*Odontopyge* Brandt. Recueil, 110 (*bicuspidatus, flavotæniatus, gracilicornis, etc.*).

Brandt in his subdivision of *Spirostreptus* did not retain the original name of the genus for that division of it which contained the original type of the genus. Now, as *Nodopyge* contains the type of *Spirostreptus*, the name *Spirostreptus* must be used in place of *Nodopyge*. *Spiropœus* is also identical with *Spirosteptus*, and as its types belong to his subgenus *Odontopyge*, it must be used in place of *Odontopyge* on account of its priority.

12. PÆROMOPUS.

1881.—*Pæromopus* Karsch. Einige neue dip. Myr. Ber. Mus., 12 (*lysiopetalinus* = *Spirobolus angusticeps* Wood).

This genus has been considered by Latzel as identical with *Julus*, but the following from Dr. Karsch's generic description has led me to believe that it should be recognized as a valid genus:

"*Ocellis oculorum seriebus utrinque 3 tantum transversis compositis . . . antennis pedibusque longissimis . . . colo in mare appendicibus crassis haud pediformibus sat longis instructo . . . . metatarsis pedum pelma munitis.*"

None of the species of *Julus* ever attain a length of over 100 millimeters, while those of *Pæromopus* are from 150 to 165 millimeters long.

So far the mouth parts and gnathochilarium, which always present the best generic characters, have not been examined.

13. TRACHYJULUS.

1864.—*Trachyjulus* Peters. Monatsber. Kön. preuss. Akad. Wiss., 547 (*ceylonicus*).
1884.—*Trachyiulus* Latzel. Myr. Öst.-Ungar. Mon., 11, 56 (emend.).

This genus is closely related to *Acanthiulus*, but is easily separated by the following characters: Ocelli in a single series. Antennæ and legs moderately long. Posterior border of first segment carinated, sides not produced as in *Acanthiulus*. Other segments, except the last, with 13 to 21 rows of carinæ.

First, second, and third segments each with one pair of legs, fourth, footless. Peters' orthography *Trachyjulus* ought to be used instead of *Trachyiulus*, which emendation has been used by later authors. The same must be the rule with *Acanthiulus* and *Glyphiulus*.

14. ACANTHIULUS.

1847.—*Acanthiulus* Gervais. Ann. Sci. Nat., 70 (*blainvillii*).

This genus was first recognized by Gervais as a subgenus of *Julus*, but as it bears no relation to *Julus* it has been raised by later authors to a generic rank.

I would call attention to the fact that Latzel has considered it as probably identical with *Trachyjulus* Peters, and has given preference to the latter name, although it was given nearly twenty years afterwards.

In this paper I have considered *Acanthiulus* as distinct from *Trachyjulus*. My reasons for this may be found in the following characters which I have culled from Gervais's descriptions and figures of *A. blainvillii*.

Ocelli in more than one series; antennæ resembling that of *Cambala*; first and last segments smooth; other segments striate beneath and armed above with eight rows of tubercles, eight on each segment; also a median dorsal series of indistinct tubercles.

Sides of first segment produced backwards (male?).

15. CRASPEDOSOMIDÆ.

1814.—*Iulides* Leach. Trans Linn. Soc., 376 (*in part*).
1842.—*Craspedosomadæ* Gray. Todd's Cyclop. of Anat. and Phys., III, 546 (*in part*).
1847.—*Chordeumiden* Koch. Syst. Myr., 49 and 119.
1869.—*Craspedosomidæ* Humbert & Saussure. Rev. et Mag. Zool., 153 (*in part*).
1884.—*Chordeumidæ* Latzel. Myr. Öst.-Ungar. Monarch., II, 171.

According to the synonymy given above this family should be called *Craspedosomidæ* and not *Chordeumidæ*.

Gray's and not Koch's name should be employed.

16. CHORDEUMA.

1847.—*Chordeuma* Koch. Syst. Myr., 51 and 124 (*sylvestre*).
1872.—*Trichopetalum* Harger. Amer. Journ. Sci. and Arts, 117 (in part; *iulioides*).
1884.—*Læriulus* Berlese. Acari, Myr. et Scorp ital., Fasc., XII, 6 (*inermis* = *C. sylvestre*).

I agree with Dr. Latzel in considering the *Trichopetalum iulioides* Harger as belonging to the genus *Chordeuma;* although there is some probability that it may be the young of some *Campodes*. *Læriulus* Berlese, which was placed by him in the *Lysiopetalidæ* is a member of the *Craspedosomidæ*, and is also identical with *Chordeuma*.

17. CAMPODES.

1847.—*Campodes* Koch. Syst. Myr., 51 and 126 (*flavicornis* = *fusicornis*).
1869.—*Pseudotremia* Cope. Proc. Amer. Philos. Soc., 180 (in part; *vudii* = *C. flavicornis*).
1883.—*Cryptotrichus* Packard. Proc. Amer. Philos. Soc., 189 (*Spirostreptus cæsioannulatus* Wood = *C. flavicornis*).

Campodes Koch has always been overlooked by American authors, as, in fact, have been nearly all the works of Koch. The result has been the description of several genera that are identical with earlier names of his. In the above synonomy I have included *Pseudotremia* Cope as forming a part of *Campodes*, while *Cryptotrichus* Packard is also identical with the latter.

18. POLYDESMINÆ.

1872.—*Polydesmia* Humbert and Saussure. Miss. scientif. Mex. Zoöl., VI, 25 (*teste* Latzel).
1880.—*Cryptodesmoidea* Karsch, Mittheil. Münch. Ent. Ver., 143.

The subfamilies of *Polydesmidæ* established by Humbert and Saussure and also retained by Latzel seem to me to be worthy of their rank.

In accordance with common custom I have changed *Polydesmia* to *Polydesminæ*.

19. SPHÆRIODESMINÆ.

1872.—*Sphæriodesmia* Humbert and Saussure. Miss. scientif. Mex. Zoöl., VI, 20 (*teste* Latzel).

20. LEPTODESMUS.

1847.—*Oxyurus* Koch. Syst. Myr., 60 and 139 (*vestitus*).
1859.—*Leptodesmus* Saussure. Linn. Ent., XIII, 323 (*granulosus*).

As *Oxyurus* Koch is preoccupied (*Oxyurus* Raf., Pisces, 1810; *Oxyurus* Swains., Aves, 1827), *Leptodesmus* Saussure must be employed instead of *Oxyurus*.

21. RHACOPHORUS.

1847.—*Rhacophorus* Koch. Syst. Myr., 59 and 137 (*Poly. conspersus* Perty).
1864.—*Cryptodesmus* Peters. Monatsber. kön. preuss. Akad. Wiss., 621 (*alatus*, etc.).

Cryptodesmus has been rightly considered by Latzel as being a subgenus of *Rhacophorus*.

The following is a key to the subgenera:

a. First dorsal plate normal, not concealing the head ..... RHACOPHORUS.
aa. First dorsal plate strongly produced forward and completely concealing the head. CRYPTODESMUS.

22. STENONIA.

1842.—*Stenonia* Gray. Todd's Cyclop. Anat. and Phys., III, 546 (*druii*).
1847.—*Platyrhacus* Koch. Syst. Myr., 59 and 131 (*scaber* = *Stenonia, s. str.*).
1860.—*Odontodesmus* Saussure. Myr. Mex., 70 (*javanus*).
1864.—*Acanthodesmus* Peters. Monatsber. kön. preuss. Akad. Wiss., 547 (*scutatus*, etc.)

Platyrhacus, *Odontodesmus* and *Acanthodesmus* have been considered as subgenera of *Stenonia;* but as *Stenonia* has not been properly subdivided—no subgenus *Stenonia* having been set apart—I have compiled the following analytical key for the separation of the subgenera:

a. Basal joint of legs not provided with a spine.
  b. Body slender, lateral carinæ moderately developed, repugnatorial pores submarginal, second dorsal plate much wider than the first ..... ODONTODESMUS.
  bb. Body wide; lateral carinæ strongly developed; repugnatorial pores superior, more or less distant from lateral margin of carinæ; second dorsal plate normal. STENONIA.
aa. Basal joint of legs armed with a spine ..... ACANTHODESMUS.

23. SCYTONOTUS.

1847.—*Scytonotus* Koch. Syst. Myr., 57 and 130 (*scabricollis* = *granulatus* Say).
1864.—*Trachelodesmus* Peters. Monatsber. kön. preuss. Akad. Wiss., 623 (*constrictus*).

I agree with Dr. Latzel in considering *Trachelodesmus* as a subgenus of *Scytonotus*. The subgenera may be distinguished as follows:

a. Anterior segments not strikingly attenuated; antennæ and legs normal. SCYTONOTUS.

aa. Anterior segment noticeably attenuated; legs rather long; antennæ long and slender..... TRACHELODESMUS.

24. SPHÆROTHERIINÆ.

1833.—*Sphærotheria* Brandt. Bull. Soc. Natur., Moscow, VI, 198.

The subfamilies of *Glomeridæ* established by Brandt and retained by other authors are probably valid. In accordance with common custom I have changed *Sphærotheria* to *Sphærotheriinæ*.

25. GLOMERINÆ.

1833.—*Glomeridia* Brandt. Bull. Soc. Natur., Moscow, VI, 194.

This subfamily should be called *Glomerinæ* and not *Glomeridia*.

26. MEINERTIA, nom. gen. nov.

1870.—*Scotophilus* Meinert. Myr. Mus. Haun., Pt. 1, 40 (*bicarinatus*).

As *Scotophilus* Meinert is preoccupied (*Scotophilus* Leach, Mamm., 1822; *Scotophilus* Swains., Aves, 1837), another name must be used as a substitute, and I propose the above name in honor of its original describer, Dr. Meinert, to whom all myriapodists are indebted for his exceilent works on the Chilopods.

27. LINOTÆNIA.

†1842.—*Strigamia* Gray. Todd's Cyclop. of Anat. and Physiol., Vol. III, 547.

1847.—*Stenonia* Koch. Syst. Myr., 85 and 187 (in part; *Geophilus acuminatus* Leach = *Linotænia acuminata* (Leach)).

1847.—*Linotænia* Koch. Syst. Myr., 86 and 188 (*Geophilus crassipes* Koch = *Linotænia acuminata* (Leach)).

1866.—*Scolioplanes* Bergsöe and Meinert. Nat. Tidsskr., IV, 98 (*Geophilus maritimus* Leach, *Geophilus acuminatus* Leach, and *Linotænia crassipes* Koch = *Linotænia acuminata* (Leach).

In their work on the "*Danemark's Geophiler*," Bergsöe and Meinert erected the genus *Scolioplanes*, which included *Geophilus maritimus* Leach, *Geophilus acuminatus* Leach, and *Linotænia crassipes* Koch, but as the last species (*crassipes* Koch = *acuminata* Leach) was the type of Koch's *Linotænia*, the latter name must be used in place of *Scolioplanes*.

The true type (*Geophilus linearis* Koch) of *Stenotænia* is a *Geophilus*, and *Stenotænia* must be considered identical with *Geophilus*.

28. THEATOPS.

1844.—*Theatops* Newport. Trans. Linn. Soc., 409 (*Cryptops postica* Say.)

†1863.—*Opisthemega* Wood. Journ. Phila. Acad. Nat. Sci., 35 (*postica* = *Cryp. postica* Say)

Opisthemega Wood has principally been used in place of *Theatops*, because Newport based his genus upon an erroneous character—the possession of an ocellus. In his description of Theatops, Newport says: "*Ocelli distincti*"; while in the description of its species, he says: "*Ocellis inconspicuis, lateralibus.*" In these two statements Newport seems to contradict himself and to be uncertain about the possession of an ocellus. Probably Newport has mistaken an accumulation of pigment for an ocellus, and his observations as to the possession of an ocellus are erroneous, at any rate, Say did not see a trace of an ocellus in the same specimens.

The supposition that Newport has made an erroneous observation is further strengthened by the fact that the possession of an ocellus is the only difference between *Theatops* and *Opisthemega*. Notwithstanding this erroneous derivations of *Theatops*, it must be used in place of *Opisthemega*.

29. MONOPS.

1847.—*Monops* Gervais. Aptères, IV, 294 (*Cryptops nigra* Newport).

This name was first used by Billb. in 1820, as a genus of Crustacea, and Monops Gervais must give place to another.

30. RHYSIDA.

1844.—*Branchiostoma* Newport. Trans. Linn. Soc., 411 (*lithobiodes*).
1863.—*Rhysida* Wood. Journ. Phila. Acad. Nat. Sci., 40.

As *Branchiostoma* Newport is preoccupied by a genus of fishes, Dr. Wood has proposed the name *Rhysida* as a substitute, which we are compelled to use in place of *Branchiostoma*.

31. DACETUM.

1844.—*Heterostoma* Newport. Trans. Linn. Soc., 275 (*trigonopoda.*)
1847.—*Dacetum* Koch. Syst. Myr., 77 & 171 (*capense*).

Because *Heterostoma* Newport is preoccupied (*Heterostoma* Hartmann, Moll., 1843) we must use its synonym, *Dacetum* Koch, instead.

INDIANA UNIVERSITY, June 1, 1888.

NOTES UPON THE SPECIES OF MYRIOPODA SYNGNATHA, DESCRIBED BY THOMAS SAY.*

BY CHARLES H. BOLLMAN.

During the past year, while endeavoring to identify the North American species of myriapods described by early authors, I have spent considerable time studying those described by Mr. Thomas Say, whose only work on our species appeared in the Journ. Acad. Nat. Sci. Phila., for 1821. As my conclusions in several cases in regard to the identification of his species are different from the opinions held by other authors I have deemed it best to embody my views in the form of a paper.

The only types of Say's species that are probably now preserved are those sent by him to Dr. Leach and deposited by the latter gentleman in the British Museum. These specimens were afterwards studied by Newport and Gray, and lately the type of *Cryptops posticus* and the genus *Theatops* have been reëxamined by Mr. R. Innes Pocock.

In the following paper I have marked with an asterisk (*) those species the types of which are now preserved in the collection of the above museum. Of the seventeen species described by Say all except one are good, the names of three, on account of preoccupation, have had to be changed, and six have since been transferred to other genera.

1. **Julus impressus** Say. Journ. Acad. Nat. Sci. Phila., 102, 1821.
Parajulus impressus Bollman. Ann. N. Y. Ac. Sc., 34, 1887.

This species, at first considered to be valid, was afterwards identified by Dr. Wood with his *Julus venustus*. A comparison of these two species shows that they are very different. Besides, *venustus* is not found south of Kentucky, while Say's specimens of *impressus* were from Georgia and Florida, although it ranges north into the region of *venustus* (Connersville, Brookville, and Bloomington, Ind.). This species should now stand as *Parajulus impressus* (Say).

2. **Julus punctatus** Say. Journ. Acad. Nat. Sci. Phila., 102, 1821 (preoccupied by *Julus punctatus* Leach, 1815).
Julus stigmatosus Brandt. Recueil, 88, 1841 (preoccupied by *Julus stigmatosus* Eichwald, Zool. spec., II, 124, 1830 (=*Strongylosoma pallipes* Olivier).

*I now regard the old group of Myriopoda as being composed of two utterly distinct divisions, one including the *Pauropoda* and *Diplopoda*, to which I have restricted the name of Myriapoda, and the other including the *Syngnatha* as more closely related to the *Hexopoda*, and should be united with it in a distinct class.

Say in naming this species was apparently unacquainted with Dr. Leach's species and used a name which had already been given to another.

In 1841 Brandt attempted to remedy this confusion of names and accordingly called Say's species *Julus stigmatosus*, but even this name, as shown above, is preoccupied.

In accordance with the rules of nomenclature, this name must be changed, and as a tribute to Dr. Say, its original describer and our first American myriopodist, I would call this species *Nemasoma sayanum* Bollman, nom. nov.

*3. **Julus annulatus** Say. Journ. Acad. Nat. Sci. Phila., 103, 1821.
Spirobolus annulatus Wood. Trans. Amer. Phil. Soc., 212, 1865.
Cambala annulata Cope. Proc. Amer. Phil. Soc., 181, 1869.
Cambala lactarius Gray. Griff. Cuv. Anim. Kingd., Pl. 135, Fig. 2, *a*, *b*, *c*, 1832.

Say's description of this well-known species seems to apply to the southern form, a fact which is strengthened by the locality, "Southern States", which he has assigned to his specimens. This is the species sent to Dr. Leach by Say under the name of *Julus lactarius*, which mistake has confused the synonymy of *Cambala annulata* and *Callipus lactarium*. The name of this species now stands as *Cambala annulata* (Say).

*4. **Julus lactarius** Say. Journ. Acad. Nat. Sci. Phila., 104, 1821.
Spirostrephon lactarius Brandt. Bull. Sc. St. Pet., 1840; Recueil, 90, 1840.
Cambala lactarius Gervais. Aptéres, IV, 134, 1847.
Lysiopetalum lactarium Packard. Amer. Nat., 555, 1883.
Platops lineata Newport. Ann. and Mag. Nat. Hist., 267, 1844.
Lysiopetalum lineatum Gervais. Aptères, IV, 133, 1847.
Reasia spinosa Sager. Proc. Acad. Nat. Sci. Phila., 109, 1856.
"*Reasia chinosa* Sager" Gervais. Cast. Exp. l'Amér. Sud, Pt. VII, 17, 1856.
Lysiopetalum eudasum McNeill. Proc. U. S. Nat. Mus., 330, 1887.

This widely distributed and well-known species was made by Brandt the type of his genus *Lysiopetalum*, but as Brandt's genus seems to be identical with the *Callipus* of Risso, the name of our American species must stand as *Callipus lactarius* (Say).

5. **Julus marginatus** Say. Journ. Acad Nat. Sci. Phila., 106, 1821 (preoccupied by *Julus marginatus Olivier*, Encycl. Meth., Ins., VII, 414, 1792 (=*Glomeris marginata* (Villers).
Spirobolus spinigerus Wood. Proc. Acad. Nat. Sci. Phila., 15, 1864.

A comparison of specimens which have here before been referred to *marginatus* and *spinigerus* with Say's description of this species has convinced me that the *marginatus* of Say and the *spinigerus* of Wood are identical. Say says his specimens are "*glabrous*," and this is only true in specimens of *spinigerus*, while in our so-called *marginatus* the segments are very densely punctate.

This conclusion is further strengthened by the fact that the species we have referred to *marginatus* is not found in Florida or southern

Georgia, where Say's types were from. If my opinions in regard to these two species are false, the name *marginatus* must at all odds be given up and *Julus americæ-borealis** of Palis. de Beauvois be used in stead.

This species must now stand as *Spirobolus spinigerus* Wood.

6. Julus pusillus Say. Journ. Acad. Nat. Sci. Phila., 106, 1821 (preoccupied by *Julus pusillus Leach*, 1814).
Julus minutus Brandt, Recueil, —, 1841.
Julus sayii Newport. Ann. and Mag. Nat. Hist., 268,1844.
Julus lineatus McNeill. Proc. U. S. Nat. Mus., 324, 1887 (*Pensacola, Fla.*).
Nemasoma minutum Bollman. Proc. U. S. Nat. Mus., 405, 1888.

As *pusillus* was preoccupied, Brandt, in 1841, proposed the name *minutus* instead. But since this species belongs to the genus *Nemasoma* of Koch it should now stand as *Nemasoma minutum*.

7. Polydesmus serratus Say. Journ. Acad. Nat. Sci. Phila., 106, 1821 (*Virginia*).
Polydesmus canadensis Newport. Ann. and Mag. Nat. Hist., 265, 1844 (*Hudson's Bay*).
Polydesmus glaucescens Koch. Syst. Myr., 133, 1847 (*North America*).
Polydesmus pennsylvanicus Koch. Syst. Myr., 123, 1847 (*Pennsylvania*).

This species on account of its rather imperfect description seems to have caused considerable trouble in regard to its identification, European writers considering it the same as *glauscescens* Koch, and closely allied to *complanatus* of Europe, in which they have been correct, while American authors have referred to it another species—the *moniliaris* of Koch. This latter species has the lateral carinæ finely denticulate and the squamiform divjsions much elevated, while in *serratus*, according to Say's description, the lateral carinæ have only 3 or 4 denticulations and the squamiform divisions low.

8. Polydesmus granulatus Say. Journ. Acad. Nat. Sci. Phila., 107, 1821.
Scytonotus scabricollis Koch. Syst. Myr., 130, 1847.
Scytonotus lævicollis Koch. Syst. Myr., 131, 1847.

This well-known species, which was afterwards described as new by Koch and made the type of the genus *Scytonotus*, should now stand as *Scytonotus granulatus* (Say).

9. Polyænus fasciculatus Say. Journ. Acad. Nat. Sci. Phila., 108, 1821.

This rare species still retains the name given to it by Say.

Its *habitat* is from Massachusetts to Indian Territory, and it does not seem to be found in the North Central States.

10. Lithobius spinipes Say. Journ. Acad. Nat. Sci. Phila., 109, 1821.
Lithobius transmarinus Koch. Gatt. Lith., 33, 1862.
Lithobius mordax Koch. Ibid., 34, 1862.

Spinipes has always been identified by European and American authors with the *Lithobius forficatus* of Linnæus, but on account of the

Julus americæ-borealis Palis. de Beauvois, Ins. d' Afr. et d' Amér., 155,1805. This name has been reduced and mutilated by Gervais and other authors to *americanus*.

habitat—"*Southern United States*"—the number of antennal joints—*thirty*—and the number of scuta with their posterior angles produced—"*five or six*"—I have regarded *spinipes*, *transmarinus* and *mordax* as identical.

Although there is some doubt as to the exact locality of this species, nevertheless I am strongly inclined to believe that Say's specimens were from the Southern States, for out of the nineteen species noticed by Say, only one is mentioned as occurring north of Virginia, south of which State *forficatus* does not extend.

This species should still retain Say's name.

***11. Scolopendra marginata** Say. Journ. Acad. Nat. Sci. Phila., 110, 1821.

This species, the type of which was sent to Dr. Leach, and is now in the British Museum, is identical with the *Scolopendra morsitans* of Linnæus.

12. Scolopendra viridis Say. Journ. Acad. Nat. Sci. Phila., 110, 1821.
Scolopendra punctiventris Newport. List. Myr. Brit. Mus., 5, 1844 (*Florida*).
Scolopendra parva Wood. Proc. Acad. Nat. Sci. Phila., 16, 1864 (*Georgia*).

A valid species.

***13. Cryptops hyalina** Say. Journ. Acad. Nat. Sci., Phila., 111, 1821 (*Georgia* and *Florida*).
Cryptops milberti Gervais. Aptères, IV, 592, 1847 (*New Jersey*).
Cryptops asperipes Wood. Proc. Acad. Nat. Sci. Phila., 129, 1867 (*Virginia*).
Cryptops sulcatus Meinert. Proc. Amer. Phil. Soc., 211, 1886 (*Kentucky*).

An examination of a large amount of material has shown that the North American species are the same and identical with the *Cryptops hyalina* of Say.

***14. Cryptops sexspinosus** Say. Journ. Acad. Nat. Sci. Phila., 12, 1821.
Scolopocryptops 6-spinosus Newport. Trans. Linn. Soc., 107, 1844.
Scolopocryptops sexspinosus Gervais. Aptères, IV, 298, 1847.
Scolopendropsis helvola Koch. Syst. Myr., 175, 1847.
Scolopocryptops georgicus Meinert. Proc. Amer. Phil. Soc., 180, 1886.

This well-known species now stands as *Scolopocryptops sexspinosus* (Say).

***15. Cryptops posticus** Say. Journ. Acad. Nat. Sci. Phila., 112, 1821 (*Georgia* and *Florida*).
Theatops postica Newport. Trans. Linn. Soc., 410, 1844 (*based on Say's type*).
Opisthemega postica Wood. Journ. Acad. Nat. Sci. Phila., 35, 1862 (*North Carolina*).
Opisthemega crassipes Meinert. Proc. Amer. Phil. Soc., 209, 1886 (*Florida, Virginia*, and *Kentucky*).
Theatops crassipes Bollman. Ann. N. Y. Acad. Nat. Sci., 110, 1888 (*Tennessee*).

The type of this species was sent to Dr. Leach and deposited by him in the British Museum. Mr. Newport in 1844 made it the type of his genus *Theatops*, and on account of the possession of ocelli which he assigned to this specimen it has been regarded as different from the

species described by Say. However, a recent examination of type of *Theatops* by Mr. R. Innes Pocock has proven that Newport was wrong as to the specimen having occelli. Taking this into consideration the synonomy of this species must stand as indicated above and the name as *Theatops posticus* (Say).

*16. **Geophilus rubens** Say. Journ. Acad. Nat. Sci. Phila., 113, 1821.
Geophilus cephalicus Wood. Journ. Acad. Nat. Sci. Phila., 44, 1862.

On account of the difference of coloration assigned by Say and Newport to this species, I do not feel sure of my identification. Say says his specimen is "*red*," and this would prevent me from identifying *rubens* with *cephalicus;* but Newport, who has examined and described Say's type, which is in the British Museum, concerning the coloration says: "*Saturate aurantiacus, linea mediana duplici nigra e segmento corporis primi ad penultimum ducta.*"

When we take into consideration this peculiar pattern of coloration, the number of pairs of legs (50), and the length of anal pair (*hardly exceeding the preceding*), there is only one known species with which we can possibly identify the *rubens* of Say, and that our common and widely distributed *G. cephalicus* Wood.

That Say's species is a true *Geophilus* is indicated by the following from his description: "*segments with two longitudinal impressed lines.*"

If Say had not mentioned this and no types of his species had been preserved I would hardly hesitate to identify *rubeus* with the *fulva* of Sager or the *bothriopus* of Wood. As it is I cannot see why we should not consider *rubens* and *cephalicus* identical.

17. **Geophilus attenuatus** Say. Journ. Acad. Nat. Sci. Phila., 114, 1821 (*Southern States*).
Geophilus bipuncticeps Wood. Journ. Acad. Nat. Sci. Phila., 45, 1862 (*Illinois, South Carolina*).
Geophilus georgianus Meinert. Proc. Amer. Phil. Soc., 219, 1886 (*Georgia*).
Schendyla? perforatus McNeill. Proc. U. S. Nat. Mus., 325, 1887 (*Pensacola, Fla.*).

Of the seventeen new species described by Say this one is the most inaccurately described and the one which has given me the most trouble in regard to its identification.

Nevertheless when we take into consideration that there are only three species (*latro, bipuncticeps*, and *foveatus*) found in or very near the region in which Say collected, and compare them with Say's description of *attenuatus*, I have found that only one, *bipuncticeps*, agrees in regard to the shape of body and the length of anal legs.

Although most persons would consider *attenuatus* unidentifiable, I think, at least for the present or until more light can be thrown upon Say's species, it is best to regard it the same as *bipuncticeps*.

Besides the above seventeen new species Say has also noticed two others—*Fontaria virginiensis* and *Scutigera forceps*.

The first under the name of *Julus virginiensis* is placed as a note along with *Polyd. serratus*. Concerning this species Say says:

> I have found specimens double the usual size in the Southern States. It seems also to vary in only having the second joint of the feet mucronate, and in being destitute of the robust ventral spines between the feet.

Although he may have been right in regard to the identification of his northern specimens, it seems to me as if his southern specimens belonged to *Fontaria crassicutis* (Wood).

Scutigera forceps is mentioned after *Lithobius spinipes* under the name of *Cermatia coleoptrata*. His identification of our species with the European is wrong, although there is considerable resemblance between the two.

INDIANA UNIVERSITY, *March 9, 1889.*

NOTES UPON THE NORTH AMERICAN MYRIAPODS DESCRIBED BY C. L. KOCH.

BY CHARLES H. BOLLMAN.

As Dr. Koch's papers* relating to the North American myriapods seem to have been overlooked by previous authors, I have thought it best to bring together in a paper my notes relating to his species.

The second of Dr. Koch's works is merely a more extended account of the species mentioned in his first work, with plates of each.

Of the fourteen new species described by Koch only five are good. I desire to express my thanks to Dr. Lucien M. Underwood, of Syracuse, N. Y., for the privilege of examining a copy of Koch's "Die Myriapoden."

1. **Spirostreptus nutans** Koch. Syst. Myr., 104, 1847 (*North America*); Die Myr., I. 14, pl. 7, fig. 14, 1863.

As the descriptions and figures of this species plainly show, it should be referred to *Parajulus canadensis* (Newport).

2. **Spirostreptus clavipes** Koch. Syst. Myr., 105, 1847 (*Pennsylvania*); Die Myr., II, 103, pl. 115, fig. 226, 1863.

This species, described from a male specimen, is identical with the preceding. The differences Koch draws between them are sexual. His figure of the first pair of legs seems to indicate that his specimens were not full grown.

3. **Campodes flavicornis** Koch. Syst. Myr., 126, 1847 (*Pennsylvania*); Die Myr., II, 17, pl. 68, fig. 140, 1863.

This species, the type of the genus *Campodes*, has been well described by Koch. It is the same as *Spirostrephon cæsioannulatus* Wood and the *Pseudotremia vudii* of Cope. *Campodes* Koch (=*Cryptotrichus* Packard).

4. **Campodes fuscicornis** Koch. Syst. Myr., 127, 1847 (*Pennsylvania*); Die Myr., II, 16, pl. 68, fig. 139, 1863.

This new species, as Koch has hinted, "*Vielleicht nur Abart der vorigen*," is only a slight color variety of the preceding, and is not worthy of specific or subspecific rank.

5. **Scytonotus scabricollis** Koch. Syst. Myr., 130, 1847 (*Pennsylvania*); Die Myr., II, 41, pl. 80, fig. 165, 1863.

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* 1847. System der Myriapoden.
1863. Die Myriapoden I, II.

This species, the type of the genus *Scytonotus*, is identical with the *Polydesmus granulatus* of Say.

6. **Scytonotus lævicollis** Koch. Syst. Myr., 131, 1847 (*North America*); Die Myr., II, 41, pl. 80, fig. 163, 1863.

The only differences Koch makes between this and the preceding species is in the number of rows of scale-like tubercules on the first dorsal plate, *one* instead of *three*. This character is utterly worthless, as the scales on the first dorsal plate vary in number and are sometimes almost obliterated. On account of this variation his *lævicollis* is the same as *scabricollis*, and hence identical with Say's *granulatus*.

7. **Scytonotus nodulosus** Koch. Syst. Myr., 131, 1847 (*Pennsylvania*); Die Myr., II, 43, pl. 80, fig. 164, 1863.

This species, which seems to be valid, bears, in its general appearance, a resemblance to *Polydesmus*, but the position of the repugnatorial pore excludes it from that genus. It can not be the *Scytonotus setiger* of Wood, because the latter species has the squamation more like that of *granulatus*, and not as in *Polydesmus*. His figures of the first dorsal plate do not agree in regard to the position of the anterior row of tubercules; one shows them along and inside the anterior margin, as no doubt they are, while the other represents them as placed on the margin and appearing as sharp and deep serrations.

8. **Polydesmus glaucescens** Koch. Syst. Myr., 133, 1847 (*North America*); Die Myr., I, 59, pl. 26, fig. 51, 1863.

This is identical with the *Polydesmus serratus* of Say.

9. **Polydesmus pennsylvanicus** Koch. Syst. Myr., 133, 1847 (*Pennsylvania*); Die Myr., II, 18, pl. 69, fig. 142, 1863.

Probably identical with *serratus*. It differs in having four scale-like tubercules in the first row. Koch may have drawn his figure from one of the ultimate segments, and this will account for the larger number of scales. On the ultimate segments of *serratus* there is occasionally a tendency for four scales in the first row.

Pennsylvanicus can not be the same as *P. branneri* Bollman, for the latter has so far only been found in the Tennessee mountains. Several Italian authors have recorded specimens of *pennsylvanicus* from northern Italy, but this is no doubt due to an erroneous identification.

10. **Polydesmus moniliaris** Koch. Syst. Myr., 135, 1847 (*Pennsylvania*); Die Myr., II, 20, pl. 69, fig. 143, 1863.

A valid species. It is the same as the *Polydesmus serratus* of Wood.

11. **Euryurus maculatus** Koch. Syst. Myr., 138, 1847 (*? habitat*); Die Myr., I, 7, pl. 3, fig. 8, 1863.

According to Peters, who has probably examined the type specimen, *maculatus* is the same as *Euryurus erythropygus* (Brandt). In this view he seems to be correct, for I can find no difference between the description of *maculatus* and specimens of *erythropygus*.

12. Fontaria virginiensis Koch. Syst. Myr., 141, 1847 (*North America*); Die Myr., I, 71, pl. 32, fig. 62, 1863.

The specimens Koch has referred to the *Julus virginiensis* of Drury do not belong to that species, but seem to be very close, if not identical, with *Fontaria butleriana* Bollman from Indiana. His figures represent a distinct, narrow, yellow band along the posterior margin of the segments as in the latter species.

13. Fontaria coriacea Koch. Syst. Myr., 141, 1847 (*Virginia*); Die Myr., I, 72, pl. 32, fig. 63, 1863.

A valid species of which *Polydesmus corrugatus* Wood is a synonym. His specimens have a yellow band along the posterior margin of the segments as is the case in the eastern specimens of *coriacea*.

14. Fontaria oblonga Koch. Syst. Myr., 142, 1847 (*Pennsylvania*); Die Myr., I, 73, pl. 32, fig. 64, 1863.

A valid species belonging to the same group as *castanea*, *tennesseensis*, and *pulchra*, and perhaps closely allied to the latter, from which it is separated by the superior position of the repugnatorial pore. Koch's specimens, as indicated by the color, were probably not full grown.

15. Scolopendropsis helvola Koch. Syst. Myr., 175, 1847 (*North America*); Die Myr., II, 34, pl. 76, fig. 156, 1863.

Identical with *Scolopocryptops sexspinosus* (Say). From this and two other species Koch has redescribed it seems as if he was unaware of Say's paper on the North American Myriapods.

INDIANA UNIVERSITY, *March 15, 1887*.

CLASSIFICATION OF THE MYRIAPODA.

BY CHARLES H. BOLLMAN.

In this paper I have given keys for the determination of all groups above species. When a genus has been so inaccurately described that it could not be introduced into the key without affecting the natural order of genera, I have placed it, with its short diagnosis, as a foot-note.

On account of the great difference between the two principal orders of the old group of Myriapoda, as has been recently shown by Pocock, Kingsley, and several continental writers, I have regarded the old group as forming two distinct divisions: One, the Syngnatha, as being more closely related to the Hexapoda, and should be united with it to form one class;* the other, the *Diplopoda* and *Pauropoda* † as forming another class, to which I have restricted the name of Myriapoda. I have regarded the *Julidæ* and their allies as being the oldest group on account of the following facts:

(1) That they are the only group of which we have any geological evidence.

(2) That they have more segments than other groups, thus showing less specialization (the 3-footed condition of the young is due to the amount of food-yolk and not to any ancestral form.)

(3) That they have simple tracheæ.

The Myriapoda may be divided into the following subclasses:

a. Antennæ simple, not ramose, 5–8 jointed; some or nearly all of the segments with two pairs of legs; pairs of legs 13 or more..... DIPLOPODA.—A.

aa. Antennæ ramose, bearing 3 long, jointed appendages; none of the segments with 2 pairs of legs; pairs of legs, 9 ..... MONOPODA.‡—B.

Subclass A.—DIPLOPODA.

This subclass contains the following two superorders:

a. Anus situated in ultimate segment; maxillæ forming a plate; body not ornamented with fasciculæ of hairs; copulatory feet present...CHILOGNATHA.—I.

aa. Anus situated in the penultimate segment; maxillæ subpediform, not forming a plate; body ornamented with fasciculæ of hairs; copulatory feet absent. PODOCHILA.§—II.

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* For this class I propose the name *Etymochila* (ετυμος, *true*; χιλος, *lip*), on account of the fact that it is the only group of Arthropoda which has a true *labium*. The Syngnatha and Hexapoda are considered as subclasses.

† I have considered the *Pauropoda* as being more closely allied to the *Diplopoda* on account of the anterior position of the genital opening, the form and position of the copulatory appendix at base of second pair of legs as in the *Polyxenidæ*, and the general make-up of the body.

‡ MONOPODA.—I propose this new subclass for the reception of the *Pauropoda*.

§ PODOCHILA.—I propose this new superorder for the reception of the *Polyxenidæ*. Pocock ranked this family as a subclass, but I think its relations to the *Chilognatha* are too close to admit of so high a rank.

Superorder I.—CHILOGNATHA.

This division is divisible into the following orders:

a. Copulatory organs of male formed by a transformation of one or both pairs of legs of seventh segment; alimentary tract straight; tracheæ simple.
b. Mandibles and gnathochilarium rudimentary; labrum sinuate; mouth parts more or less suctatorial.....COLOBOGNATHA.—I.
bb. Mandibles and gnathochilarium not rudimentary; labrum tridentate; mouth parts not suctatorial .....HELMINTHOMORPHA.—II.
aa. Copulatory organs of male formed by accessory pairs of legs, situated at the posterior part of body; labrum sinuate or unidentate; alimentary tract bent; tracheæ branched .....ONISCOMORPHA.—III.

Order I.—COLOBOGNATHA.

This order contains the following family:

Family I.—POLYZONIIDÆ.

Analysis of the subfamilies of Polyzoniidæ.

a. Gnathochilarium represented by an acute triangular plate; dorsal plates not sulcate; lateral carinæ not well developed.
b. Body filiform, pilose; ocelli absent; anal scale present; antennæ strongly clavate; mouth parts strongly suctatorial .....SIPHONOPHORINÆ.—I.
bb. Body wide and depressed, not pilose; ocelli present; anal scale absent; antennæ not strongly clavate; mouth parts less suctatorial.
POLYZONIINÆ.—II.
aa. Gnathochilarium well developed, subsimilar to that of the *Julidæ;* dorsal plates sulcate and covered with numerous short stiff hairs; lateral carinæ well developed.
c. Body filiform; mentum rectangular; hypostoma not well developed; anal scale absent; segments not tuberculate ....ANDROGNATHINÆ.—III.
cc. Body wide, depressed; mentum hammer-shaped; hypostoma well developed; anal scale present; segments tuberculate .....PTATYDESMINÆ.—IV.

Subfamily I.—SIPHONOPHORINÆ.

Includes the genus *Siphonophora* Brandt, which is distinguished by the characters given for the subfamily.

Subfamily II.—POLYZONIINÆ.

*Analysis of the genera of Polyzoniinæ.**

a. Anterior margin of first dorsal plate emarginate, not concealing the ocelli.
OCTOGLENA Wood.
aa. Anterior margin of first dorsal plate rounded, advanced forward to the base of the antennæ, concealing nearly all the ocelli.....POLYZONIUM† Brandt.

* *Siphonotus* Brandt. Bull. Sc. Acad. St. Petersb., 1836. This genus probably belongs to this subfamily. It has two ocelli as in *Polyzonium*, but the antennæ are sub-similar in form to that of *Geophilus.*

† *Polyzonium* (= *Platyulus* Gervais, = *Leiosoma* Victor, = *Petaserpes* Cope, = *Piestodesmus* Fanzago, = *Hirudisoma* Fanzago, = *Hexaglena* McNeill. Proc. U. S. Nat. Mus., 328, 1887).

Subfamily III.—ANDROGNATHINÆ.*

Analysis of the genera of Andrognathinæ.

a. Fifth segment normal; pores not raised on a pedicel ..... DOLISTENUS Fanzago.

aa. Lateral carinæ of fifth segment deeply emarginate; the repugnatorial pores raised on a pedicel, the first placed on the anterior lobe of fifth segment, rest on posterior border of other segments ..... ANDROGNATHUS Cope.

Subfamily IV.—PLATYDESMINÆ.

Analysis of the genera of Platydesminæ.

a. Dorsal plates with two large median tubercles, anterior with smaller ones. PSEUDODESMUS Pocock.

aa. Dorsal plates with two transverse rows of small smooth tubercles. PLATYDESMUS† Lucas.

Order II.—HELMINTHOMORPHA.

This order is divisible into the following suborders:

a. Cardo of mandibles and promentum of gnathochilarium present; segments 30 or more ..... IULUIDEA.—I.

aa. Cardo of mandibles absent; promentum of gnathochilarium absent; segments 20 or 21; copulation foot of male formed from the anterior pair of seventh segment ..... POLYDESMOIDEA.—II.

Suborder I.—IULUIDEA.

This suborder is divisible into the two following superfamilies:

a. Copulation foot of male formed from both pairs of legs of seventh segment; cardo of gnathochilarium single ..... JULOIDÆ.—I.

aa. Copulation foot of male formed from the anterior pair of legs of seventh segment; cardo of gnathochilarium double ..... CALLIPODOIDÆ.‡—II.

Superfamily I.—Juloidæ.

This contains the following families:

a. Repugnatorial pores present; anal segment rounded or produced into a spine (ovaries surrounded by a common membrane) ..... JULIDÆ.—II.

aa. Repugnatorial pores absent; anal segment produced into two slender papillæ or unidentate (ovaries not surrounded by a common membrane). CRASPEDOSOMIDÆ.§—III.

**Andrognathinæ* (= Family *Andrognathidæ* Cope. Proc. Amer. Phil. Soc., 182, 1869).

†*Platydesmus* Lucas (=*Piestodesmus* Lucas, =*Brachycybe* Wood).

‡After comparing Risso's description of *Callipus* several times with specimens of *Lysiopetalum* I have failed to see why it should not be considered the same as *Lysiopetalum*. Since *Lysiopetalum* is a synonym of *Callipus*, the family and superfamily names must be made to agree with *Callipus*.

§ *Craspedosomidæ* (= *in part Craspedosomadæ* Gray, 1842). As this name is based on the oldest genus and besides is older than Koch's German name, *Chordeumiden*, it must be used in place of the latter.

Family II.—JULIDÆ.

Analysis of the subfamilies of Julidæ.

a. Gnathochilarium stipes separated by the promentum; mentum entire, touching promentum; spatula absent.

b. None of the anterior segments apodous, 1, 2, 3, 4 each with a pair of legs; gnathochilarium stipes smaller than promentum; cardo absent; mandibulary combs 10 (9); antennæ short and thick.....SPIROBOLINÆ.—V.

bb. Fourth segment apodous, 1, 2, and 3 (except in *Glyphiulus*) each with a single pair of legs; gnathochilarium stipes larger than promentum; cardo present; antennæ not short and thick.

c. Promentum entire; mandibulary combs 8–10.....SPIROSTREPTINÆ.—VI.

cc. Promentum divided; mandibulary combs (5) 6–7..... CAMBALINÆ.—VII.

aa. Gnathochilarium stipes not separated by the promentum; mentum bipartite, not touching the promentum, which is small and separated from the mentum by the stipes; spatula present; third segment apodous.

d. Mandibular combs 10 (9); second pair of legs dwarfed; ♂ promentum, first segment and first pair of legs (6-jointed) very large.

PARAJULINÆ.—VIII.

dd. Mandibular combs 4.

e. Only the ventral plates of the first and second segments free; ♂ genital ducts opening through the coxæ of second pair of legs...JULINÆ.—IX.

ee. All the ventral plates free; ♂ genital ducts not opening through the coxæ of second pair of legs.....NEMASOMINÆ.—X.

Subfamily V.—SPIROBOLINÆ.

This subfamily contains the genus *Spirobolus** Brandt.

Subfamily VI.—SPIROSTREPTINÆ.

Analysis of the genera of Spirostreptinæ.

a. Segments without carinæ or spinelike warts.

b. Repugnatorial pores beginning on the sixth segment; mandibular combs 10.

SPIROSTREPTUS† Brandt.

bb. Repugnatorial pores beginning on the fifth segment; mandibular combs 8.

ALLOPORUS Porath.

aa. Segments with carinæ or spinelike warts.

c. Third segment with a single pair of legs.

d. Ocelli in a single series; segments with 20 rows of spinelike warts, first dorsal plate carinated .....TRACHYJULUS Peters.

dd. Ocelli in about 9 rows; segments with about 8 rows of spinelike warts, first dorsal plate smooth .....ACANTHIULUS Gervais.

cc. Third segment with two pairs of legs; ocelli in many series; segments with 10–11 rows of spinelike warts, first carinated.....GLYPHIULUS Gervais.

**Analysis of subgenera of Spirobolus.*

a. Dorsal part of segments without scobina .....SPIROBOLUS, *s. str.*

aa. Dorsal part of all or nearly all the segments with scobina.....RHINOCRINUS.

†*Analysis of subgenera of Spirostreptus.*

a. Anal valves without a sharp or blunt spine which passes beyond anal segment.

SPIROSTREPTUS, *s. str.*

aa. Anal valves with a sharp or blunt spine which passes beyond anal valves.

The subgenus *Nodopyge* Brandt, according to the rules of nomenclature, must give way to *Spirostreptus.*

ODONTOPYGE Brandt.

Subfamily VII.—CAMBALINÆ.

Analysis of the genera of Cambalinæ.

a. Segments carinated; ocelli in a single series; first pair of legs of male 6-jointed, unarmed ..... CAMBALA Gray.

aa. Segments not carinated; ocelli in several series.

b. First pair of legs of male 7-jointed; mandibular combs 6 (5); transverse suture of segments with circular depressions ..... NANNOLENE Bollman.

bb. First pair of legs of male 4-jointed; mandibular combs 7.

JULOMORPHA Porath.

Subfamily VIII.—PARAJULINÆ.

This subfamily includes the American genus *Parajulus* Humbert & Saussure.

Subfamily IX.—JULINÆ.

Analysis of the genera of Julinæ.

a. Ocelli, if present, more than 1 or 2.

b. First pair of legs of male 5-jointed, first tarsi lobed.

c. Antennæ and legs long; ocelli always in 3 series (*species large*).

PÆROMOPUS* Karsch.

cc. Antennæ and legs short; ocelli none or in several series (*species small*).

BLANIULUS Gervais.

bb. First pair of legs of male 3-jointed, very small and strongly hooked, tarsi never lobed; ocelli absent or in many series ..... JULUS† Linnæus.

aa. Ocelli represented by 1 or 2 large ones on each side of the head.

STEMMIULUS Gervais.

Subfamily X.—NEMASOMINÆ.

Embraces the genus *Nemasoma* Koch.

Family III.—CRASPEDOSOMIDÆ.

Analysis of the subfamilies of Craspedosomidæ.

a. Anal segment with two long slender papillæ; dorsal plates without large carinæ.

b. Both pairs of legs of seventh segment of male transformed into a copulatory organ; pairs of legs ♂ 48, ♀ 50 ..... CRASPEDOSOMINÆ.—XI.

bb. Both pairs of legs of seventh and the anterior pair of eighth segment transformed into copulatory organs ..... CAMPODINÆ.—XII.

bbb. Both pairs of legs of seventh segment, including the posterior pair of sixth and anterior pair of eighth segment, transformed into a copulatory organ; pairs of legs ♂ 45, ♀ 49; body strongly juliform; lateral carinæ absent; setigerous tubercles only developed on the posterior segments.

CHORDEUMINÆ.—XIII.

aa. Anal segment without slender papillæ, strongly unidentate; dorsal plates with about 12 large carinæ, between which are small tubercles; legs short; entire body and legs granulated ..... STRIARIINÆ.—XIV.

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* Karsch's definition of this genus is so short that I doubt if it belongs to this subfamily.

† *Julus* (= *Mesoiulus* Berlese). Berlese has divided *Julus* into six subgenera, but it seems to me that they are unworthy of their rank.

Subfamily XI.—CRASPEDOSOMINÆ.

Analysis of the genera of Craspedosominæ.

a. Lateral carinæ large.
  b. Lateral carinæ bent downwards; segments convex above, concave beneath. RHISCOSOMA Latzel.
  bb. Lateral carinæ horizontal; segments flat above, convex beneath. ATRACTOSOMA Fanzago.
aa. Lateral carinæ absent or very weak; setigerous tubercles well developed. CRASPEDOSOMA* Leach.

Subfamily XII.—CAMPODINÆ.

Analysis of the genera of Campodinæ.

a. Dorsal plates marked with sharp narrow carinæ; under parts deeply reticulated; lateral carinæ distinct..... BRANNERIA† Bollman.
aa. Dorsal plates never carinated; under parts lightly reticulated.
  b. Anterior pair of legs of eighth segment of male 5-jointed.
    c. Back not scaly; setigerous tubercles almost absent; segments almost circular; legs rather short; second article of eighth pair of legs of male stout, last armed with a claw..... CAMPODES‡ Kochl
    cc. Back scaly, depressed; setigerous tubercles — — —; legs long; second article of eighth pair of legs of male slender, last not armed with a claw..... PSEUDOTREMIA Cope.
  bb. Anterior pair of legs of eighth segment of male 2-jointed; setigerous tubercles well developed..... SCOTERPES § Cope.

Subfamily XIII.—CHORDEUMINÆ.

Includes the European genus *Chordeuma* Koch.

Subfamily XIV.—STRIARIINÆ.

Includes the American genus *Striaria* Bollman.

Superfamily II.—Callipodoidæ.

This superfamily only includes the following family:

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* *Analysis of subgenera of Craspedosoma.*

a. Ocelli absent..... HAASIA, subgen. nov.
aa. Ocelli present..... CRASPEDOSOMA, s. str.

Haasia is named in honor of Dr. Erich Haase, of Berlin, Germany. This subgenus contains *Crasp. troglodytes* Latzel and *Crasp. mamillatum* Haase, both of which are European species.

†*Branneria*, gen. nov. Type: *Craspedosoma carinatum* Bollman. Ann. N. Y. Acad. Nat. Sci., 108, 1888 (*Mossy Creek, Tenn.*). It is easily separated from its relatives by the character of the dorsal plates and the large lateral carinæ. I have put it in this subfamily on the supposition that all the American genera belong here. Named after Dr. J. C. Branner, State geologist of Arkansas.

‡Campodes(=*Pseudotremia* (in part)=*Cryptotrichus* Packard).

§ *Analysis of the subgenera of Scoterpes.*

a. Ocelli absent.
  b. Eighth pair of legs of male ending in a claw..... SCOTERPES.
  bb. Eighth pair of legs of male not ending in a claw..... ZYGONOPUS.
aa. Ocelli present; eighth pair of legs of male not ending in a claw. TRICHOPETALUM.

Family IV.—CALLIPODIDÆ.

Includes the genus *Callipus* of Risso.

Suborder II.—POLYDESMOIDEA.

Contains the following families:

a. Pleural and ventral plates, except those of the two anterior segments, not free; segments 19 or 20; pairs of legs (♂) 28 or (♀) 29, or (♂) 30 or (♀) 31. POLYDESMIDÆ.—V.

aa. Pleural and ventral plates free; segments 21; pairs of legs 32; shape of body as in the *Glomeridæ*.....GLOMERIDESMIDÆ.*—VI.

Family V.—POLYDESMIDÆ.

This family is divisible into two subfamilies:

a. Body elongate, contractile into a spire; lateral carinæ never strongly depressed. POLYDESMINÆ.—XV.

aa. Body short, very convex, contractile into a ball; carinæ strongly depressed. SPHÆRIODESMINÆ.—XVI.

Subfamily XV.—POLYDESMINÆ.

Analysis of the genera.

a. Repugnatorial pores placed on the 5, 7, 9, 10, 12, 13, 15–19 segments.
  b. Femora of legs not spined.
    c. A swelling around the repugnatorial pore.
      d. Anal segment more or less sharp.
        e. Dorsal plates with a longitudinal sulcus, smooth; lateral carinæ small; body narrow.
          f. Body strongly julid; lateral carinæ rudimentary or line-like; anal segment decurved..STRONGYLOSOMA Brandt.
          ff. Body less julid; lateral carinæ very plain; anal segment with the end excised.....ORTHOMORPHA† Bollman.
        ee. Dorsal plates not distinctly sulcate; smooth or scaly; lateral carinæ large; body wide.
          g. Back convex.
            h. Dorsal plates smooth; lateral carinæ not serrate. LEPTODESMUS‡ Saussure.
            hh. Dorsal plates rough; lateral carinæ very large and the margins serrate. ODONTOTROPIS Humb. and Sauss.
          gg. Back flat.
            i. Repugnatorial pores placed on the upper part of lateral carinæ. RHACIS Saussure.
            ii. Repugnatorial pore placed on the lateral margin of carinæ.
              k. Repugnatorial pore surrounded by a round swelling.
                l. Segments with a few indistinct tubercles along the margins (species white).....CHÆTASPIS Bollman.

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* If Gervais's statements and figures of *Glomeridesmus porcellus* are true it should represent the type of a new family. It combines a few characters of the *Polydesmidæ* and *Glomeridæ*, under the latter of which Gervais placed it.

† *Orthomorpha* Bollman for *Paradesmus* Saussure, which is preoccupied.

‡ As *Oxyurus* Koch is preoccupied, *Leptodesmus* Saussure must be used instead.

ll. Segments with 4 or 5 rows of tubercles (species brownish)..... SCYTONOTUS Koch.*

kk. Repugnatorial pore surrounded by a long oval swelling.

m. Lateral carinæ projecting upwards, horn-like; back smooth..... RHACHIDIMORPHA Saussure.

mm. Lateral carinæ horizontal; back tuberculate.

n. Pairs of legs ♂ 30, ♀ 31.

o. Segments with less than 3 rows of feebly developed tubercles..... RHACOPHORUS.†—Koch.

oo. Segments each with 3 rows of well-developed tubercles..... POLYDESMUS Leach.

nn. Pairs of legs ♂ 28, ♀ 29.... BRACHYDESMUS.—Heller.

dd. Anal segment quadrate.

p. Repugnatorial pores placed on margin of carinæ.

q. Anal plate not warty; back smooth or with indistinct scale-like tubercles; first dorsal plate as wide as second. EURYURUS Koch.

qq. Anal plate with two warts; back with scale-like tubercles; first dorsal plate smaller than the second.... POLYLEPIS ‡ Bollman.

pp. Repugnatorial pores placed on the upper side of carinæ.

r. Margins of lateral carinæ not serrate; anal segment ending in three points. OXYDESMUS Humb. and Sauss.

rr. Margins of lateral carinæ serrate; anal segment ending in two points. STENONIA § Gray.

cc. No swelling around the repugnatorial pore, which is somewhat above. ICOSIDESMUS Humb. and Sauss.

bb. Femora of legs spined; lateral carinæ more or less bent downwards. FONTARIA Gray.

aa. Repugnatorial pores on the 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 segments. STRONGYLODESMUS Saussure.

aaa. Repugnatorial pores on the 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 segments. EURYDESMUS Saussure.

aaaa. Repugnatorial pores only on the fifth segment; femora armed with a spine. STENODESMUS Saussure.

**Analysis of subgenera of Scytonotus.*

a. Anterior part of body not especially attenuated; legs rather short..... SCYTONOTUS, s. str.

aa. Anterior part of body much attenuated; legs long; antennæ slender. TRACHELODESMUS Peters.

† Analysis of subgenera of Rhacophorus.

a. First dorsal plate normal..... RHACOPHORUS, s. str.

aa. First dorsal plate large, almost hiding head..... CRYPTODESMUS Karsch.

‡ *Polylepis* Bollman for *Pachyurus* Saussure, which is preoccupied.

§ Analysis of subgenera of Stenonia.

a. Coxæ produced into a spine..... ACANTHODESMUS.

aa. Coxæ not produced into a spine.

b. Body narrow; repugnatorial pores lateral; the second dorsal plate much wider than second ..... ODONTODESMUS.

bb. Body wide; repugnatorial pores superior..... STENONIA, s. str.

Subfamily XVI.—SPHÆRIODESMINÆ.

Analysis of the genera.

a. The fourth and fifth dorsal plates largest; some of the posterior with a row of tubercles.....SPHÆRIODESMUS Peters.

aa. The third and fourth dorsal plates largest; dorsal plates tuberculated. CYPHODESMUS Peters.

aaa. The third dorsal plate largest; dorsal plates smooth. CYCLODESMUS Humb. and Sauss.

aaaa. The second dorsal plate largest.

b. Anal segment small .....ONISCODESMUS Gervais and Goudot.

bb. Anal segment large as in the *Glomeridæ*.....CYRTODESMUS Gervais.

Order III.—ONISCOMORPHA.

This order contains the family *Glomeridæ*, which is related to the preceding family.

Family VII.—GLOMERIDÆ.

Analysis of the subfamilies of Glomeridæ.

a. Segments 13; pleural plates 11 or 12; pairs of legs ♀ 21, ♂ 23; ocelli in more than one series .....SPHÆROTHERIINÆ.—XVII.

aa. Segments 11 or 12; pleural plates 10; pairs of legs ♀ 17, ♂ 19; ocelli in a single series.....GLOMERIINÆ.—XVIII.

aaa. Segments 9; antennæ 5-jointed; ocelli in several series...OLIGASPIINÆ.*—XIX.

Sub-family XVII.—SPHÆRIOTHERIINÆ.

Analysis of the genera of Sphæriotheriinæ.

a. Antennæ 7-jointed, the sixth joint smaller than the fifth. SPHÆROTHERIUM Brandt.

aa. Antennæ 6-jointed, the sixth much larger than the fifth.....ZEPHRONIA Gray.

Subfamily XVIII.—GLOMERIINÆ.

Analysis of the genera of Glomeriinæ.

a. Mentum bipartite; dorsal plates smooth, not marginate.

b. Copulation feet of the male 5-jointed, ending in a simple, weak, crooked joint, which bears a short and thick bristle; 12 dorsal plates plainly developed. GLOMERIS Latreille.

bb. Copulation foot of male 3-jointed, ending in a shear or forceps-like piece, which does not bear a bristle; only 11 dorsal plates plainly developed. LATZELIA †Bollman.

aa. Mentum entire; dorsal plates warty and scaly, their borders strongly margined. GERVAISIA Waga.

Subfamily XIX.—OLIGASPIINÆ.

Contains the South-African genus *Oligaspis* Wood.

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* If Wood's description of the genus *Oligaspis* is correct it should represent a new subfamily. As shown by the figures his types are adult specimens.

† *Latzelia* gen. nov. Type: *Glomeris minima* Latzel. I have named this new genus after Dr. Robert Latzel, of Vienna, the illustrious Austrian myriapodist, and the describer of *Glomeris minima*.

Superorder II.—PODOCHILA.

This division embraces the following:

Order IV.—PSELAPHOGNATHA.

Family VIII.—POLYXENIDÆ.

This family includes the cosmopolitan genus *Polyxenus*.

Subclass B.—MONOPODA.

This subclass includes the

Order V.—PAUROPODA.

Family IX.—PAUROPODIDÆ.

This family is divisible into two subfamilies.

a. Segments depressed, sculptured; legs short, not or scarcely extending beyond sides of body; (brownish; motions slow) .....EURYPAUROPODINÆ.—XX.

aa. Segments not depressed nor sculptured; legs longer, extending beyond sides of body (pale, motions agile).....PAUROPODINÆ.—XXI.

Subfamily XX.—EURYPAUROPODINÆ.

Analysis of the genera.

a. Dorsal plates 10; large lateral hairs on 2, 4, 7, 9, (10?) segments.
Brachypauropus Latzel.

aa. Dorsal plates 7; large lateral hairs on 2, 3, 4, 5, 6 segments.
Eurypauropus Ryder.

Subfamily XXI.—PAUROPODINÆ.

Includes the genus *Pauropus* Lubbock.

INDIANA UNIVERSITY, *April 3, 1889.*

CLASSIFICATION OF THE SYNGNATHA.*

BY CHARLES H. BOLLMAN.

In accordance with the views recently advanced by Pocock, Kingsley, and several continental writers, I have regarded the *Syngnatha* as being more closely allied to the *Hexapoda* than to any orders of the old group of *Myriapoda*. For the class including the *Syngnatha* and *Hexapoda*, I propose the name *Etymochila*, in reference to the fact that they are the only two groups which have a true labium. I have arranged the following classification according to an ascending series. My reasons for placing the *Lithobiidæ* lowest are as follows:

1 (*a*) According to the investigations of Haase, in *Lithobius*, *Henicops*, *Cryptops*, and in young specimens of *Scolopendra* and *Dacetum*, the spiracles are characterized by a feeble margin, a shortish cone, no closing apparatus, and by the separate apertures of the tracheæ.

(*b*) That in the *Geophilidæ* and *Scolopendridæ* the tracheal system is most highly developed.

2. In the distribution of the genera of ANAMORPHA (*Henicops*, *Lithobius*, and *Scutigera*) we see indications of their oldness, while in the distribution of a large number of genera of EPIMORPHA we observe that they are confined to small areas and not cosmopolitan as the others.

Although the *Epimorpha* may have the highest development of a tracheal system, nevertheless in many points the *Geophilidæ* show indications of a degenerate family.

Class ETYMOCHILA.

Subclass I.—SYNGNATHA.

A comparison of the characters of the *Epimorpha* and *Anamorpha* of Meinert shows that his divisions should have the rank of orders. They may be characterized as follows:

a. Pairs of legs 15; coxæ large; females with external genital armature; hindgut straight; young born with seven pairs of legs ..... ANAMORPHA.

aa. Pairs of legs always more than 21; coxæ small; females without external genital armature; hind gut bent; young born with as many pairs of legs as adult EPIMORPHA.

*Since *Syngnatha*, as defined by Leach, is an older name than the *Chilopoda* of Latreille, it should be used instead of the latter.

Order I.—ANAMORPHA.

This order, although the *Cermatobiidæ* tend to form a connecting link, may be divided into two suborders:

a. Spiracles in two series, lateral, with strong chitinous walls; eyes not truly faceted; coxæ of prehensorial legs joined and armed with teeth; maxillary palpus 3-jointed, armed with a claw, joints without spines; dorsal plates distinctly 15; antennæ not multiarticulate; tarsi not or a few of the last multiarticulate; claw of female genitalia with basal spines.....UNGUIPALPI.

aa. Spiracles in one series, 6, dorsal, without strong chitinous walls; eyes faceted; coxæ of prehensorial legs not distinctly coalesced, armed with long spines; maxillary palpus 4-jointed, unarmed, joints with long spines; dorsal plates 8, rest reduced to mere rudiments; antennæ and legs multiarticulate; claw of female genitalia without basal spines .....SCHIZOTARSIA.

Suborder I.—UNGUIPALPI.

Analysis of families.

a. Tarsi of all legs triaticulate; spiracles strictly lateral .....LITHOBIIDÆ.—I.

aa. Tarsi not all triarticulate; spiracles somewhat dorsal.....CERMATOBIIDÆ.—II.

Family I.—LITHOBIIDÆ.

Analysis of genera.

a. Labrum unidentate; a single large ocellus on each side of head; legs unarmed. HENICOPS Newport.

aa. Labrum tridentate; ocelli absent or more than one; legs armed with spines. LITHOBIUS* Leach.

Family II.—CERMATOBIIDÆ.

Contains the East Indian genus *Cermatobius* Haase.

Suborder II.—SCHIZOTARSIA Brandt.

Includes the following family:

Family III.—SCUTIGERIDÆ.

Includes the cosmopolitan genus *Scutigera* Lamarck.

Order II.—EPIMORPHA Meinert.

Analysis of families.

a. Pairs of legs 21 or 23; antennæ more than 14-jointed; pairs of spiracles 9, 10, or 19; anal pleuræ large, scutelliform.....SCOLOPENDRIDÆ.—IV.

aa. Pairs of legs never less than 30; antennæ 14-jointed; pairs of spiracles two less than pairs of legs; anal pleuræ coxiform.....GEOPHILIDÆ.—V.

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* *Analysis of subgenera of Lithobius.*

a. Posterior angles of none of the dorsal plate produced.....ARCHILITHOBIUS.

aa. Posterior angles of the 11 and 13 dorsal plates produced.....HEMILITHOBIUS.

aaa. Posterior angles of the 9, 11, and 13 dorsal plates produced.

b. Coxæ of last four legs with pores .....LITHOBIUS.

bb. Coxæ of last five legs with pores .....PSEUDOLITHOBIUS.

aaaa. Posterior angles of the 7, 9, 11, and 13 dorsal plates produced..NEOLITHOBIUS.

aaaaa. Posterior angles of the 6, 7, 9, 11, and 13 dorsal plates produced. EULITHOBIUS.

Family IV.—SCOLOPENDRIDÆ.

Analysis of subfamilies.

a. Pairs of legs 21.
  b. Tarsi, except anal, biarticulate; pairs of spiracles 19; ocelli absent. PLUTONIINÆ.—I.
  bb. Tarsi, except last two, biarticulate; pairs of spiracles 10; ocelli absent or single ..... CRYPTOPINÆ.—II.
  bbb. All the tarsi triarticulate; pairs of spiracles 9 or 10; ocelli 4. SCOLOPENDRINÆ.—III.
aa. Pairs of legs 23; tarsi, except the last two, biarticulate; pairs of spiracles 10; ocelli absent or present ..... SCOLOPENDROPSINÆ.—IV.

Subfamily I.—PLUTONIINÆ.

Contains the European genus *Plutonium* Cavanna.

Subfamily II.—CRYPTOPINÆ.

Analysis of genera.

a. Last dorsal plate normal; anal legs not crassate.
  b. Ocelli absent ..... CRYPTOPS Leach.
  bb. Ocelli present, single ..... EREMOPS* Bollman.
aa. Last dorsal plate twice as large as preceding; anal legs short and thick; ocelli absent ..... THEATOPS Newport.

Subfamily III.—SCOLOPENDRINÆ.

Analysis of genera.

a. Pairs of spiracles 9.
  b. Spiracles not branchiform.
    c. Claw of maxillary palpus simple, unarmed; anal pair of legs short and crassate ..... ASANADA Meinert.
    cc. Claw of maxillary palpus armed on the inner side with two teeth.
      d. Claw of anal pair of legs not crenulate beneath.
        e. Cephalic plate subcordiform, usually partly covering first dorsal plate. SCOLOPENDRA† Linnæus.
        ee. Cephalic plate more or less round or quadrate; partly concealed by first dorsal plate ..... CORMOCEPHALUS Newport.
      dd. Claw of anal legs crenulate ..... RHODA Meinert.
  bb. Spiracles branchiform.
    f. Claw of maxillary palpus armed on the inner side with a long acute tooth; anal pair of legs normal ..... OTOSTIGMA Porath.
    ff. Claw of maxillary palpus armed on the inner side with two long acute teeth; anal pair of legs not normal.
      g. Tarsi of anal pair of legs very much depressed .. EUCORYBAS Gerstäcker.
      gg. Anal legs short and thick but the tarsi not flattened. CUPIPES Kohlrausch.

**Eremops*, Nom. gen. nov. for *Monops* Gervais, which is preoccupied.

† *Scolopendra* may be divided into two subgenera.
  a. Only the femora of anal pair of legs with spines ..... Scolopendra, s. str.
  aa. Femora of more than anal pair with spines ..... Collaria Porath.

aa. Pairs of spiracles 10.
h. Anal pair of legs normal.
i. First spiracle suboval.....RHYSIDA* Wood.
ii. First spiracle trema-shaped.....TREMATOPTYCHUS Peters.
hh. Anal legs crassate; spiracles sieve-like .....DACETUM† Koch.

Subfamily IV.—SCOLOPENDROPSINÆ.

Analysis of genera

a. Ocelli absent.
b. Tarsi of anal legs triarticulate.
c. Dorsal plates not sulcate, first without a sulcus, last somewhat pointed.
SCOLOPOCRYPTOPS Newport.
cc. Dorsal plates bisulcate, first with a transverse sulcus, last not pointed.
OTOCRYPTOPS Haase.
bb. Tarsi of anal legs 14-jointed.....NEWPORTIA Gervais.
aa. Ocelli four; tarsi triarticulate as in Scolopocryptops..SCOLOPENDROPSIS Brandt.

Family V.—GEOPHILIDAE.

Analysis of the subfamilies of Geophilidæ.

a. Pleuræ of prehensorial legs exposed on each side of the basal plate; cephalic plate long; basal plate small.....MECISTOCEPHALINÆ.—V.
aa. Pleuræ of prehensorial legs not exposed on each side of the basal plate.
b. The spiracle and dorsal plates touching no pleural plates between them.
GEOPHILINÆ.—VI.
bb. Between the spiracle and dorsal plate are 1–3 rows of small pleural plates.
HIMANTARIINÆ.—VII.

Subfamily V.—MECISTOCEPHALINÆ.

Includes *Mecistocephalus* Newport.

Subfamily VI.—GEOPHILINÆ.

Analysis of the genera of Geophilinæ.

a. Mandibles without a dental plate.
b. First pair of maxillæ with two palpiform processes.....GEOPHILUS Leach.
bb. First pair of maxillæ without two palpiform processes.
c. Exterior part of first maxillæ biarticulate.
d. Anal legs 7-jointed; mandibles with five pectinate plates.
MESOCANTHUS Meinert.
dd. Anal legs 6-jointed; mandibles with a single pectinate plate.
e. Penultimate pair of legs normal.
f. Claw of prehensorial legs without a basal tooth.
g. Claw of prehensorial legs not excavated...CHÆTECHELYNE Meinert.
gg. Claw of prehensorial legs excavated on under side.
AGATHOTHUS‡ Bollman.

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*As *Branchiostoma* Newport is preoccupied (Costa, Pisces, 1834), Dr. Wood in 1861 proposed the name *Rhysida* to take its place.

†*Heterostoma* Newport is preoccupied (Hartm., Moll., 1843), and *Dacetum* Koch. must be used instead.

‡AGATHOTHUS, gen. nov. Type—*Scolioplanes gracilis* Bollman. Ann. N. Y. Ac. Sci., 110, 1888. Deriv.: ἀγαθός, good; ἦθος, character.

ff. Claw of prehensorial legs with a basal tooth .....LINOTÆNIA* Koch.

ee. Penultimate pair of legs short and thick, attenuated, clawless; segments about 150..... STYLOLÆMUS† Karsch

cc. Exterior part of first maxillæ entire.

h. Claw of prehensorial legs entire; dorsal plates sulcate.

MEINERTIA‡ Bollman.

hh. Claw of prehensorial legs biincised; dorsal plates not sulcate.

DIGNATHODON Meinert.

aa. Mandibles with a dental plate and several pectinate plates.

i. Dorsal plates sulcate.

j. Mandibles with several pectinate plates.

STIGMATOGASTER Latzel.

jj. Mandibles with a single pectinate plate.

k. Claw of max. palpus pectinate; labrum free in the middle; outer part of first maxillæ with trace of palpiform process.

PECTINIUNGUIS§ Bollman.

kk. Claw of max. palpus not pectinate; labrum not free in the middle; outer part of first maxillæ without trace of palpiform process .....SCHENDYLA Bergsöe and Meinert.

ii. Dorsal plates not sulcate.....BOTHRIOGASTER Szeliwanoff.

Subfamily VII.—HIMANTARIINÆ.

Analysis of the genera of Himantariinæ.

a. Pleural plates between spiracle and dorsal plates in one row.

b. Spiracle plate much larger than the prescutellum; mandibular stipes with 7 or 8 pectinate plates.....ORYA Meinert.

bb. Spiracle plate almost as large as the prescutellum; mandibular stipes with 4 or 5 pectinate plates .....ORPHNÆUS Meinert.

aa. Pleural plates between spiracle and dorsal plates in two or three series.

c. None of the posterior segments tuberculate.

d. Spiracle plate larger than the prescutellum; pleuræ of anal segment small, not porous.....NOTIPHILIDES Latzel.

dd. Spiracle plate smaller than the prescutellum; pleuræ of anal segment very large, porous.....HIMANTARIUM Koch.

cc. Some of the posterior segments tuberculate.....GONIBREGMATUS Newport.

INDIANA UNIVERSITY, *May 18, 1889.*

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* *Linotænia* Koch (=*Scolioplanes* Bergsöe and Meinert).

† This genus may not belong here. Karsch's description is very indefinite and is compared with *Linotænia* and *Himantarium*.

‡ *Meinertia*—Nom. gen. nov. for *Scotophilus* Meinert, which is preoccupied. Named after Dr. Fred. Meinert, of Copenhagen.

§ *Pectiniunguis* Bollman. [Bull 46. U. S. Nat. Mus., p. 113.] This genus is divisible into two subgenera:

a. Anal pair of legs 6-jointed.....*Pectiniunguis.*

aa. Anal pair of legs 5-jointed.....*Nannopus* Bollman

In this paper I have given the synonymy of the various species and analytical keys whereby they may be determined.

As numerous attempts have been made to divide this family into smaller groups, I have given keys for all the subfamilies and genera known to date.

Family SCOLOPENDRIDÆ.

1844.—*Scolopendridæ* Newport. Trans. Linn. Soc., 275 and 374.

The Scolopendridæ are Chilopoda belonging to the order Epimorpha and are characterized by having 21–23 pairs of legs, 17–33-jointed antennæ, 9, 10, or 19 pairs of spiracles, and the pleuræ of anal pair of legs scutelliform.

They may be divided into the following subfamilies:

a. Pairs of legs 21.
  b. Tarsi, except that of anal pair, biarticulate; pairs of spiracles 19; ocelli absent. PLUTONIINÆ.—I.
  bb. Tarsi, except that of penultimate and anal pairs, biarticulate; pairs of spiracles 10; ocelli absent or single.....CRYPTOPINÆ.—II.
  bbb. Tarsi of all the legs triarticulate; pairs of spiracles 9 or 10; ocelli 4. SCOLOPENDRINÆ.—III.
aa. Pairs of legs 23; tarsi, except that of anal and penultimate pairs, biarticulate; pairs of spiracles 10; ocelli absent or 4.....SCOLOPENDROPSINÆ.—IV.

Subfamily I.—PLUTONIINÆ.

1881.—*Scolopendridæ plusiostigmi* Cavanna. Bull. Ent. Ital., 176.

This subfamily only includes the European genus *Plutonium*.

Subfamily II.—CRYPTOPINÆ.

1844.—*Scolopendrinæ* Newport. Trans. Linn. Soc., 378 (*in part*).
1847.—*Scolopendrides morsicantes* Gervais. Aptères, IV, 243 and 250 (*in part*).
1881.—*Cryptopsii* Kohlrausch. Archiv f. Naturg.

Analysis of genera of Cryptopinæ.

a. Last dorsal plate normal; anal pair of legs not crassate.
  b. Ocelli absent.....CRYPTOPS.—I.
  bb. Ocelli present, single.....EREMOPS.*
aa. Last dorsal plate twice as large as the preceding; anal pair of legs short and thick; ocelli absent.....THEATOPS.—II.

* *Eremops* nom. gen. nov. for *Monops* Gervais, which is preoccupied. Deriv.: ἐρημος, lonely; ὤψ, an eye.

Genus I.—*Cryptops.*

1844.—*Cryptops* Leach. Trans. Linn. Soc., 384 (*hortensis*).

Type.—*Cryptops hortensis* Leach.

Etymology—κρυπτός, concealed; ὤψ, eye.

This genus contains the following North American species:

1. Cryptops hyalinus.

1821.—*Cryptops hyalina* Say. Journ. Acad. Nat. Sci. Phila., III (*Florida*); Say, Œuvres Ent., sp. 3, 1822; Newport, Trans. Linn. Soc., 409, 1844; Newport, Cat. Myr. Brit. Mus., 60, 1856; Wood, Jour. Acad. Nat. Sci. Phila., 34, 1862; Wood, Trans. Amer. Phil. Soc., 168, 1865; Underwood, Ent. Amer., 65, 1887.

1847.—*Cryptops hyalinus* Koch. Syst. Myr., 175; Gervais, Aptères, IV, 293, 1847; Kohlrausch, Archiv f. Naturg., 129, 1881; Bollman, Ann. N. Y. Lyc. Nat. Hist., 107, 111, 112, 1888 (*Knoxville, Beaver Creek,* and *Mossy Creek, Tenn.*); Bollman, Ent. Amer. 6, 1888 (*Little Rock, Arkadelphia, Okolona.* and *Ultima Thule, Ark.*).

1847.—*Cryptops milberti* Gervais. Aptères, IV, 592 (*New Jersey*).

1862.—*Cryptops milbertii* Wood. Journ. Acad. Nat. Sci. Phila., 34; Wood, Trans. Amer. Phil. Soc., 168, 1865; Underwood, Ent. Amer., 65, 1887.

1867.—*Cryptops asperipes* Wood. Proc. Acad. Nat. Sci. Phila., 129 (*Montgomery Co., Va.*); McNeill, Proc. U. S. Nat. Mus., 326, 1887 (*Pensacola, Fla.*); Underwood, Ent. Amer., 65, 1887.

1886.—*Cryptops sulcatus* Meinert. Proc. Amer. Phil. Soc., 211 (*Bee Spring, Ky.*); Underwood, Ent. Amer., 65, 1887.

Habitat.—Eastern United States N. to New Jersey, Pennsylvania, and Indiana, and W. to Indian Territory.

Etymology—Lat., of glass.

For a description of this species see that of *sulcatus* Meinert.

Underwood in his synopsis of the species of this genus has regarded *milberti, asperipes,* and *sulcatus* as valid species, but it seems to me that they are all identical with *hyalinus.* I have examined a large amount of material from nine different States and have been able to find only one species.

Genus II.—THEATOPS.

1844.—*Theatops* Newport. Trans. Linn. Soc., 410 (*postica*).

1862.—*Opisthemega* Wood. Journ. Acad. Nat. Sci. Phila., 35 (*spinicauda*).

Type.—*Cryptops postica* Say.

Etymology: θεατής, a spectator; ὤψ, an eye.

A recent examination of the type of *Cryptops postica* Say, which is deposited in the British museum, by Mr. R. Innes Pocock,* has proven that Newport was mistaken as to Say's species having eyes. The elimination of this character makes *Theatops* identical with *Opisthemega;* but as the former is oldest it must be used in place of the latter, notwithstanding the fact that it is based in part upon an erroneous character. This conclusion was published by me some time before Mr. Pocock's paper appeared (*T. crassipes* Bollman, Am. N. Y. Lyc. N. H., 110, 1888; *T. spinicaudus* Boll., Ent. Amer., 6, 1888).

*Pocock, Ann. & Mag. Nat. Hist., 283–290, 1888.

Analysis of the species of Theatops.

a. Femora of anal legs unarmed; none of the tibial or tarsal joints armed above; all tarsal joints armed beneath, except the last two.....POSTICUS.—2

aa. Femora of anal legs with one or two spines at their superior interior angle; tibiæ, except the last three, armed above; all tarsal joints except the last two armed above and beneath; first tarsal joint of first pair of legs unarmed beneath .....SPINICAUDA.—3

2. Theatops posticus.

1821.—*Cryptops postica* Say. Journ. Acad. Nat. Sci. Phila., 112 (*Georgia and Floriaa*); Say, Amer. Ent., 24, 1822; Gervais, Ann. Sci. Nat., 51, 1837; Newport, Ann. & Mag. Zool., 100, 1844; Koch, Syst. Myr., 175, 1847; Gervais, Aptères, IV, 294, 1847.

1844.—*Theatops postica* Newport. Trans. Linn. Soc., 410, 1844; Newport, Cat. Myr. Brit. Mus., 71, 1856; Wood, Journ. Phila. Acad. Nat. Sci., 37, 1862; Wood, Trans. Amer. Phil. Soc., 171, 1865; Kohlrausch, Archiv Naturg., 93, 1881; Pocock, Ann. & Mag. Nat. Hist., 289, 1888.

1862.—*Opisthemega postica* Wood. Journ. Acad. Nat. Sci. Phila., 35 (*Goldsboro, N. C.*); Wood, Trans. Amer. Phil. Soc., 169, 1865; Kohlrausch Archiv Naturg., 130, 1881; Underwood, Ent. Amer., 64, 1887.

1886.—*Opisthemega crassipes* Meinert. Proc. Amer. Phil. Soc., 209 (*Jacksonville, Fla.; Pennington's Gap, Va.; Bee Spring, Ky.*); Meinert, Myr. Mus. Haun., 111, 35, 1886 (*Biloxi, Miss.*); McNeill, Proc. U. S. Nat. Mus., 326, 1887 (*Pensacola, Fla.*); Underwood, Ent. Amer., 64, 1887.

1888.—*Theatops crassipes* Bollman, Ann. N. Y. Acad. Nat. Sci., 110 (*Beaver Creek, Tenn.*).

Habitat.—East of the Mississippi River, N. to Virginia, Indiana, and Illinois.

Etymology: Lat., posterior.

A comparison of northern and southern specimens shows several differences as in *Scolopocryptops sexspinosus.*

3. Theatops spinicauda.

1862.—*Opisthemega spinicauda* Wood. Journ. Acad. Nat. Sci. Phila., 36 (*Cook Co., Ill.*); Wood, Trans. Amer. Phil. Soc., 170, 1865 (*Illinois; Allegheny Co., Pa.*); Kohlrausch, Archiv f. Naturg., 136, 1881; Meinert, Proc. Amer. Phil. Soc., 208, 1886 (*Acapulco, Mex.*); Underwood, Ent. Amer., 64, 1887.

1888.—*Theatops spinicaudus* Bollman. Ent. Amer., 6 (*Little Rock, Arkadelphia, Okolona, Muddy Fork, and Ultima Thule, Ark.*).

Habitat.—Southwestern United States S. to Acapulco, Mexico; N. through Illinois to Chicago; E. through Tennessee to the mountains, and then N. to Allegheny County, Pa.

Etymology: spina, spine; *cauda*, tail.

Subfamily III.—SCOLOPENDRIDÆ.

1844.—*Scolopendrinæ* Newport. Trans. Linn. Soc., 378.

1844.—*Heterostominæ* Newport. l. c., 244.

1844.—*Cormocephalinæ* Newport. l. c., 419.

1847.—*Scolopendrides cribrifères* Gervais. Aptères, 243 and 244.

1847.—*Scolopendrides morsicantes* Gervais. Aptères, 243 and 258.

1870.—*Heterostomii* Humb. & Sauss. Rev. et Mag. Zool., 202.
1880.—*Scolopendrii* Humb. & Sauss. Rev. et Mag. Zool., 203.
1881.—*Scolopendrides anchistrophi* Kohlrausch. Archiv f. Naturg. (*used as a tribe of Scol. cribrifères*).

Analysis of the genera of Scolopendrinæ.

a. Pairs of spiracles 9.
b. Spiracles not branchiform.
c. Claw of max. palpus simple, unarmed; anal pair of legs short and crassate. ASANADA Meinert.
cc. Claw of max. palpus armed on the inner side with two teeth.
d. Claw of anal pair of legs not crenulate beneath.
e. Cephalic plate subcordiform, usually partly covering first dorsal plate. SCOLOPENDRA.— III.
ee. Cephalic plate rounded or quadrate and partly concealed by first dorsa. plate..... CORMOCEPHALUS Newport.
dd. Claw of anal pair of legs crenulate beneath..... RHODA Meinert.
bb. Spiracles branchiform.
f. Claw of max. palpus armed on the inner side with a long, acute tooth; anal pair of legs normal..... OTOSTIGMA Porath.
ff. Claw of max. palpus armed on the inner side with two long, acute teeth; anal pair of legs not normal.
g. Tarsi of anal legs much depressed ..... EUCORYBAS Gerstäcker.
gg. Tarsi not flattened; leg short and thick..... CUPIPES Kohlrausch.
aa. Pairs of spiracles 10.
h. Anal pair of legs normal.
i. First spiracle suboval..... RHYSIDA.*—IV.
ii. First spiracle-shaped ..... TREMATOPTYCHUS Peters.
hh. Anal pair of legs crassate; spiracle sieve-like.. DACETUM † Koch.

Genus III.—SCOLOPENDRA.

1758.—*Scolopendra* Linnæus. Syst. Nat., Ed. x., 637 (restricted by later authors to *morsitans*).

Type.—Scolopendra morsitans L.

Etymology: σκολόπενδρα, scolopendra.

In the following key to the species of *Scolopendra* I have adopted Porath's name *Collaria* as a subgenus including all species which have the femora of penultimate pair of legs spinous. The other groups established, I think, are not worthy of subgeneric rank.

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* As *Branchiostoma* Newport is preoccupied (Costa, Pisces, 1834), *Rhysida* Wood must be used instead.

† *Heterostoma* Newport preoccupied (Hartm., Moll., 1843) and *Dacetum* Koch must take its place.

Analysis of the species of Scolopendra.

a. Femora of the penultimate pair of legs without spines at their upper exterior apex (*Scolopendra*).

b. First dorsal plate without a transverse sulcus.

c. Second tarsal joints, except those of the anal or anal and penultimate pairs of legs, armed beneath with a spine.

d. Femora of anal legs with two spines, both within.....DEHAANI.—4.

dd. Femora of anal legs with 4–5 spines, always two beneath; angular spine simple or bifid.....SUBSPINIPES.—5.

ddd. Femora of anal legs armed with 10–15 spines, 4–6 within, 6–9 beneath and arranged in three series; angular spine tri- or quadrifid; femora and tibiæ of anal legs margined.....MORSITANS.—6

. First dorsal plate with a transverse sulcus.

e. Second tarsal joints of all the legs unarmed. Anal legs short, armed with 10–12 spines, angular process simple or bifid; first eight antennal joints not hirsute .....WOODII.—7.

ee. Second tarsal joints, except those of anal pairs of legs armed.

f. Length 50–70^{mm} in adults; spines of anal legs 10–18.

g. Anal legs stout, width of femora 2 in width of cephalic plate, apical process armed with 4–5 spines (*western species*)..PACHYPUS.—8.

gg. Anal legs moderately short and stout, femora 2½ in cephalic plate, apical process with 2–4 spines (*eastern species*).....VIRIDIS.- 9.

ff. Length 100–150^{mm} in adults; spines of anal legs 17–25; anal legs rather long, apical process with 3–10 spines.....HEROS.—10

aa. Femora of penultimate pair of legs with spines at their upper exterior angle (*Collaria*).

h. First dorsal plate without a sulcus.

i. Anal legs long and slender, femora armed with 30–50 spines, apical proces. with 6–8 spines; joints of antennæ 17....CRUDELIS.—11,

4.—Scolopendra dehaani.

1841.—*Scolopendra dehaani* Brandt. Recueil, 59; Kohlrausch, Archiv f. Naturg., 1881; Meinert, Proc. Amer. Phil. Soc., 203, 1886 (*San Francisco, Cal.; a type of Wood's bispinipes*); Underwood, Ent. Amer., 64, 1887.

1862.—*Scolopendra bispinipes* Wood, Journ. Acad. Nat. Sci. Phila., 28 (*San Francisco, Cal.*); Wood, Trans. Amer. Phil. Soc., 166, 1865.

Habitat.—Cosmopolitan, found throughout the tropics, in United States only in California (*San Francisco*).

Etymology: Named after a Mr. De Haan.

No doubt when this and other cosmopolitan species have been carefully studied several geographical varieties may be recognized.

5. Scolopendra subspinipes.

American synonymy.

1815.—*Scolopendra subspinipes* Leach. Trans. Linn. Soc., 383; Gervais, Ann. Sc. Nat., 50, 1837; Lucas, Hist. Nat. Anim. Art., IV, 544, 1840; Brandt, Recueil, 59, 1841 (*Brazil*); Kohlrausch, Archiv f. Naturg., 96, 1881; Meinert, Proc. Amer. Phil. Soc., 202, 1886; Meinert, Myr. Mus. Haun., III, 27, 1886; Underwood, Ent. Amer., 64, 1887.

1837.—*Scolopendra audax* Gervais. Ann. Sci. Nat., 50 (*Antilles*); Newport, Trans. Linn. Soc., 388, 1844; Gervais, Aptères, 282 (*Martinique; Marie-Galante; Guadeloupe*); Koch, Syst. Myr., 163, 1847; Newport, Cat. Myr. Brit. Mus., 35, 1856; Gervais, Cast. Exp. l'Amér. Sud, 34, 1859.

1840.—*Scolopendra newportii* Lucas. Hist. Nat. Anim. Art., pt. 1, 343 (*footnote*); Gervais, Aptères, IV, 281, 1847 (*Brazil*); Newport, Cat. Myr. Brit. Mus., 38, 1856; Gervais, Cast. Exp. l'Amér. Sud, 34, 1859.

1844.—*Scolopendra placeæ* Newport. List. Myr. Brit. Mus., 3 (*Brazil*); Newport, Trans. Linn. Soc., 390, 1844; Gervais, Aptères, IV, 281, 1847; Newport, Cat. Myr. Brit. Mus., 37, 1856; Gervais, Cast. Exp. l'Amér. Sud, 34, 1859.

1844.—*Scolopendra planiceps* Newport. Trans. Linn. Soc., 391 (*Antigua*); Gervais, Aptères, IV, 284, 1847; Newport, Cat. Myr. Brit. Mus., 38, 1856; Gervais, Cast. Exp. l'Amér. Sud, 35, 1859.

1844.—*Scolopendra lutea* Newport. Trans. Linn. Soc., 392 (*In Ins. Caribæis?*); Gervais, Aptères, IV, 285, 1847; Newport, Cat. Myr. Brit. Mus., 40, 1856; Gervais, Cast. Exp. l'Amér. Sud, 35, 1859..

1847.—*Scolopendra gigantea* Koch. Syst. Myr., 155 (*West Indies, not gigantea of Linnæus*); Koch, Die Myr., II, fig. 133, 1863.

1847.—*Scolopendra ornata* Koch. Syst. Myr., 155 (*Brazil*); Koch, Die Myr., II, fig. 134, 1863.

1847.—*Scolopendra pulchra* Koch. Syst. Myr., 158 (*West Indies*); Koch, Die Myr., I, fig. 21, 1863.

1861.—*Scolopendra byssina* Wood. Proc. Acad. Nat. Sci. Phila., 10 (*Florida?*); Wood, Jour. Acad. Nat. Sci. Phila., 26, 1862 (*California*); Wood, Trans. Amer. Phil. Soc., 164, 1865.

1871.—*Scolopendra elongata* Porath. Ofvers. Vet.-Akad. Förh., 1143; Porath, Sv. Vet.-Akad. Handl., 13, 1876 (*Rio Janeiro; Porto Rico; St. Christopher*).

Habitat.—Cosmopolitan. Found throughout the tropical and subtropical regions; in United States only in California and Florida.

Etymology: *Sub*, hardly; *spina*, spine; *pes*, foot.

6. Scolopendra morsitans.

American synonymy.

1758.—*Scolopendra morsitans* Linnæus. Syst. Nat. (*America*); Newport, Trans. Linn. Soc., 378, 1844; Newport, Cat. Myr. Brit. Mus., 25, 1856 (*Tobago; Demerara*); Wood, Journ. Acad. Nat. Sci. Phila., 23, 1862 (*? Halifax, N. S.; La Union; Minititlan*); Wood, Trans. Amer. Phil. Soc., 161, 1865 (*Florida?*); Kohlrausch, Archiv f. Naturg., 104, 1881; Meinert, Proc. Amer. Phil. Soc., 200, 1886; Meinert, Myr. Mus. Haun., III, 27, 1886; Underwood, Ent. Amer., 64, 1887 (*West Indies; Surinam; Florida*).

1821.—*Scolopendra marginata* Say. Journ. Acad. Nat. Sci. Phila. (*Florida*); Say, Œuvres Ent., 22, 1822; Gervais, Aptères, IV, 276, 1847; Gervais, Cast. Exp. l'Amér. Sud, 30, 1859.

1837.—*Scolopendra brandtiana* Gervais. Ann. Sc. Nat., 50; Gervais, Aptères, IV, 280, 1847 (*Brazil; Cayenne; St. Thomas; Vera Cruz*); Gervais, Cast. Exp. l'Amér. Sud, 33, 1859; Saussure, Myr. Mex., 130, 1860.

1841.—*Scolopendra platypus* Brandt. Recueil, 61 (*Cuba; St. Domingo*); Newport, List Myr. Brit. Mus., 3, 1844 (*Tobago; Jamaica; Demerara*); Gervais, Aptères, IV, 280, 1847; Gervais, Cast. Exp. l'Amér. Sud, 33, 1859; Porath, Sv. Vet.-Akad. Handl., 11, 1876 (*St. Christopher; Surinam; Rio Janeiro*).

1844.—*Scolopendra platypoides* Newport. List Myr. Brit. Mus., 3 (*Brazil*); Newport, Trans. Linn. Soc., 380, 1844; Gervais, Aptères, IV, 281, 1847; Newport, Cat. Myr. Brit. Mus., 27, 1856; Gervais, Cast. Exp. l'Amér. Sud, 33, 1859.

1844.—*Scolopendra longicornis* Newport. List Myr. Brit. Mus., 3; Porath, Sv. Vet.-Akad. Handl., 12, 1876 (*Brazil*).

1870.—*Scolopendra californica* Humbert & Saussure. Rev. et Mag. Zool., 203 (*California*); Humb. & Sauss., Étud. Myr., 127, Tab. v, fig. 8, 1872.

1870.—*Scolopendra carinipes* Humbert & Saussure. Rev. et Mag. Zool., 204 (*Nova Granada*); Humb. & Sauss., Étud. Myr., 125, Tab. v, fig. 6, 1872.

1885.—*Scolopendra morsitans cœrulescens* Cragin. Bull. Washt. Coll. Biol. Surv., iv, 144 (*Medicine Lodge, Barber Co., Kans.*).

Habitat.—Cosmopolitan, found throughout the tropical and subtropical regions; in United States, California, Kansas, Georgia, and Florida.

Etymology: Lat., biting.

Scolopendra morsitans cœrulescens of Cragin may not be a synonym of this species. His description is so indefinite that it is almost impossible to tell to what species it may belong.

7. Scolopendra woodi.

1861.—*Scolopendra inæquidens* Wood. Journ. Acad. Nat. Sci. Phila., 24 (*Illinois*); Wood, Trans. Amer. Phil. Soc., 162, 1865 (*not inæquidens Gervais, which is the same as alternans*).

1886.—*Scolopendra woodi* Meinert. Proc. Amer. Phil. Soc., 198 (*Hilton's Head, S. C.; Beaufort, N. C.; Pennington's Gap, Va.*); Meinert, Myr. Mus. Haun., iii, 26, 1886 (*Biloxi, Miss.*); McNeill, Proc. U. S. Nat. Mus., 326, 1887 (*Pensacola, Fla.*); Underwood, Ent. Amer., 63, 1887 (*Lookout Mountain, Tenn.; Tortugas, Fla.; Georgia*); Bollman, Ent. Amer., 7, 1888 (*Fort Donaldson, Ark.*).

Habitat.—Southeastern United States N. to Illinois (*Anna; Villa Ridge, &c.*) and Indiana (*Bloomington*) and W. to Arkansas (*Fort Donaldson*).

Etymology: Named after Dr. H. C. Wood, of Philadelphia.

This species was first identified by Wood with *inæquidens* Gervais (=*alternans* Leach).

8. Scolopendra pachypus.

1878.—*Scolopendra pachypus* Kohlrausch. Beit. Kennt. Scol., 25 (*California*); Kohlrausch, Archiv Naturg., 113, 1881.

Habitat.—California (*Kohlrausch*), San Diego, Cal. (*Bollman*).

Etymology: παχὺς, thick; πούς, foot.

9. Scolopendra viridis.

1821.—*Scolopendra viridis* Say. Journ. Acad. Nat. Sci. Phila. (*Florida*); Say, Œuvres Ent., 23, 1822; Gervais, Aptères, iv, 276, 1847; Gervais, Cast. Exp. l'Amér. Sud, Pt. vii, 34 (*Brazil*); Wood, Journ. Acad. Nat. Sci. Phila., 22, 1862 (*Garden Key, Pensacola and Palatka, Fla.*); Wood, Trans. Amer. Phil. Soc., 159, 1865; Kohlrausch, Archiv Naturg., 112, 1881; Meinert, Proc. Amer. Phil. Soc., 196, 1886 (*Georgia*); Meinert, Myr. Mus. Haun., iii, 26, 1886 (*New Orleans*); McNeill, Proc. U. S. Nat. Mus., 112, 1887 (*Pensacola, Fla.*); Underwood, Ent. Amer., 63, 1887.

1844.—*Scolopendra punctiventris* Newport. List Myr. Brit. Mus., 5 (*Florida*); Newport, Trans. Linn. Soc., 387, 1844; Gervais, Aptères, iv, 277, 1847; Newport, Cat. Myr. Brit. Mus., 33, 1856; Gervais, Cast. Exp. l'Amér. Sud, Pt. vii, 34, 1859.

1861.—Scolopendra parva Wood. Proc. Acad. Nat. Sci. Phila., 10 (*Georgia*).

Habitat.—Southeastern United States N. to Tennessee (*Mossy Creek and Lookout Mountain*).

Etymology: Lat., green.

The locality, *Brazil*, assigned by Gervais (Cast. Exp. l'Amér. Sud, Pt. VII, 34) to this species is erroneous, as *viridis* is not found S. of the United States.

10. Scolopendra heros.

1853.—*Scolopendra hercs* Girard. Marcy's Red. R. Exp., App. F, 243 (*Texas*); Wood, Journ. Acad. Nat. Sci. Phila., 18, 1862 (*Louisiana, Texas, Arkansas, New Mexico, Arizona, Mexico*); Wood, Trans. Amer. Phil. Soc., 155, 1865; Porath, Sv. Vet.-Akad. Handl., 8, 1876 (*Texas*); Cragin, Bull. Washt. Coll. Biol. Surv., IV, 143 (*Turkey Creek*); Meinert, Proc. Amer. Phil. Soc., 195, 1886 (*Westfield, N. Y.; Mammoth Cave, Ky.; Key West, Fla.; Alexandria and Seabrook Island, Ga.; Mobile and Spring Hill, Ala.; Galveston, Tex.; Montevias, San Luis Potosi, and Guaymas, Mex.; San Diego, Cal.; Fort Riley, Kans.*); Underwood, Ent. Amer., 63, 1887; Bollman, Ent. Amer., 6, 1888 (*Little Rock, Murfreesboro, and Muddy Fork, Ark.*).

1861.—*Scolopendra castaniceps* Wood. Proc. Amer. Phil. Soc., 11 (*Texas*).

1862.—*Scolopendra heros castaniceps* Wood. Journ. Acad. Nat. Sci. Phila., 18, 1862; Wood, Trans. Amer. Phil. Soc., 156, 1865; Cragin, Bull. Washt. Coll. Biol. Surv., IV, 144, 1885 (*Barber County, Kans.*).

1861.—*Scolopendra polymorpha* Wood. Proc. Acad. Nat. Sci. Phila., 11 (*Fort Riley, Kans.*); Wood, Journ. Acad. Nat. Sci. Phila., 20, 1862 (*Kansas, Texas, Arizona, Mexico*); Wood, Trans. Amer. Phil. Soc., 158, 1865; Kohlrausch, Archiv Naturg., 114, 1881; Cragin, Bull. Washt. Coll. Biol. Surv., IV, 144, 1885 (*Rice, Finley, and Barber Co.*, Kans.).

1862.—*Scolopendra copeana* Wood. Journ. Acad. Nat. Sci. Phila., 27 (*California*); Wood, Trans. Amer. Phil. Soc., 165, 1865.

1885.—*Scolopendra heros pusinatica* Cragin, Bull. Washt. Coll. Biol. Surv., IV, 144 (*Medicine Lodge, Barber Co., Kans.*).

Habitat.—Central America, Mexico; in United States N. to California, Utah, Kansas, Kentucky, and Georgia.

Etymology.—Lat., a demigod.

A careful study of a large amount of material of this species may establish several subspecies.

11. Scolopendra crudelis.

1847.—*Scolopendra crudelis* Koch. Syst. Myr., 170 (*Barthelymi*); Koch, Die Myr., II, 36, Tab. LXXVII, LXXVIII, Figs. 158, 159, 1863; Porath, Sv. Vet.-Akad. Handl., 7, 1876 (*? New York*); Kohlrausch, Archiv Naturg., 20, 1881; Meinert, Proc. Amer. Phil. Soc., 194, 1886; Underwood, Ent. Amer., 63, 1887 (*Florida, Tortugas, Key West, Hayti*).

1861.—*Scolopendra longipes* Wood. Journ. Acad. Nat. Sci. Phila., 26 (*Ft. Jefferson, Garden Key, Fla.; ? Halifax, N. S.*); Wood, Trans. Amer. Phil. Soc., 163, 1865.

Habitat.—West Indies and southern Florida.

Etymology.—Lat., unmerciful.

Porath mentions a specimen of *crudelis* from *New York*, but this is erroneous or else it is one that has been introduced by shipping.

Genus IV.—RHYSIDA.

1844.—*Branchiostoma* Newport. Trans. Linn. Soc., 411 (*lithobioides*).
1862.—*Rhysida* Wood. Journ. Acad. Nat. Sci. Phila., 40.

Type.—*Branchiostoma lithobioides* Newport.

Etymology: ῥυσός, corrugated.

As *Branchiostoma* Newport is preoccupied (*Branchiostoma* Costa, 1834, *Pisces*), Dr. Wood in 1862 proposed the genus *Rhysida*.

This name has always been disregarded, but, as Newport's name is preoccupied, we must use *Rhysida* in its place.

This genus contains the following species:

12. Rhysida celer.

1870.—*Branchiostoma celer* Humbert and Saussure, Rev. et Mag. Zool., 202 (*Carolina*); Saussure and Humbert, Étud. Myr., 122, Tab. VI, f. 16, 187; Kohlrausch, Archiv Naturg., 69, 1878; Meinert, Proc. Amer. Phil. Soc., 183, 1886 (*Kingston, Jamaica; Polvon, Nicaragua*); Meinert, Myr. Mus. Haun., III, 18, 1886 (*Riacho del Oro, Buenos Ayres*); Underwood, Ent. Amer., 63, 1887.

Habitat.—Central America, West Indies; Carolina (*Saussure*).

Etymology.—Lat., quick.

The locality (*Carolina*) assigned to this species by Humbert and Saussure is probably erroneous and no doubt their specimen was from Mexico or some West Indian island, where, on the same trip, most of their collecting was done. For a description of this species see "Meinert, Proc. Amer. Phil. Soc., 183, 1886."

Subfamily IV.—SCOLOPENDROPSINÆ.

1844.—*Scolopendrinæ* Newport. Trans. Linn. Soc., 378 (*in part*).
1847.—*Scolopendrides heteropodes* Gervais. Aptères, IV, 243.
1870.—*Scolopendropsii* Humbert and Saussure, Rev. and Mag. Zoöl., 204.

Analysis of the genera of Scolopendropsinæ.

a. Ocelli present; tarsi triarticulate ..... SCOLOPENDROPSIS Brandt.
aa. Ocelli absent.
  b. Tarsi of anal legs triarticulate.
    c. Dorsal plates not sulcate, first without a transverse sulcus as in many species of *Scolopendra*, last somewhat pointed..... SCOLOPOCRYPTOPS.—V.
    cc. Dorsal plates bisulcate, first transversely, last not pointed. OTOCRYCTOPS Haase.
  bb. Tarsi of anal pair of legs 14-jointed ..... NEWPORTIA Gervais.

Genus V.—SCOLOPOCRYPTOPS.

1844.—*Scolopocryptops* Newport. Trans. Linn. Soc., 405 (*miersi*).

Type.—*Scolopocryptops miersi* Newport.

Etymology.—σκολόπενδρα, scolopendra; κρυπτός, concealed; ὤψ, eye.

Analysis of the species of Scolopocryptops.

a. Femora of anal legs armed with two large spines (*inner sometimes atrophied in northern specimens of sexspinosus*).

b. Coxæ of prehensorial legs sinuate, but never truly dentate.

c. Tarsi of anal pair of legs not densely pubescent.

d. Cephalic plate not marginate ..... MIERSI.—13.

dd. Cephalic plate marginate.

e. First antennal joint not hirsute (*eastern*) ..... SEXSPINOSUS.—14.

ee. First two antennal joints not hirsute (*western*) ..... SPINICAUDUS.—14*b*.

cc. Tarsi of anal legs densely pubescent; olive brown; head, first and last segments reddish brown ..... NIGRIDIUS.—15.

bb. Coxæ of prehensorial pair of legs dentate; tarsi of anal legs densely pubescent. GRACILIS.—16.

13. Scolopocryptops miersii.

1844.—*Scolopocryptops miersii* Newport. Linn. Trans., 405 (*Brazil*); Gray, List Myr. Brit. Mus., 7, 1844; Gervais, Aptères, IV, 298, 1847; Newport, Cat. Myr. Brit. Mus., 56, 1856; Gervais, Cast. Exp. l'Amér. du Sud, Pt. VII, Myr. and Scorp., 36, 1859; Karsch - - - -.

Not syn.—Meinert. Proc. Amer. Phil. Soc., 181, 1886; Meinert, Myr. Mus. Haun., III, 41, 1886, = ? *Scolop. meinerti* Pocock.

Habitat.—South America, West Indies, Mexico, and California (*Karsch*).

Etymology.—Named after Mr. John Miers, an English gentleman.

I have never seen any specimens of this species and the short characteristic I have given in the key is taken from Karsch's key to the species of this genus.

14. Scolopocryptops sexspinosus.

1821.—*Cryptops sexspinosus* Say. Journ. Acad. Nat. Sci. Phila., 112 (*Georgia and Florida*); Say, Œuvres Ent., 24, 1822; Gervais, Ann. Sc. Nat., 51, 1837; Newport, Ann. and Mag. Zoöl., 100, 1844; Koch, Syst. Myr., 175, 1847.

1844.—*Scolopocryptops 6-spinosa* Newport. Linn. Trans., 407; Newport, Cat. Myr. Brit. Mus., 57, 1856.

1847.—*Scolopocryptops sexspinosus* Gervais. Aptères, IV, 298; Gervais, Cast. Exp. l'Amér. du Sud, Pt. VII, Myr. and Scorp., 36, 1859; Wood, Jour. Acad. Nat. Sci. Phila., 37, 1862 (*Salem, N. C.; Cook Co., Ill.; Mississippi; Carlisle, Pa.; Charleston, S. C.; St. Louis, Mo.; Texas*); Wood, Trans. Amer. Phil. Soc., 172, 1865; Porath, Sv. Vet.-Akad. Handl. Bih. 26, 1876 (*San Paola, Brazil*); Kohlrausch, Archiv f. Natur., 54, 1878; Meinert, Proc. Amer. Phil. Soc., 179, 1886 (*Md.; Mass.; N. Y.; Pa.; Va.; Ga.; Ala.; Ky.; Iowa; W. Va.; Cal.*); Meinert, Myr. Mus. Haun., III, 14, 1886 (*New York*); McNeill, Proc. U. S. Nat. Mus., 326, 1887 (*Pensacola, Fla.*); Underwood, Ent. Amer., 63, 1887; Bollman, Ann. N. Y. Lyc. Nat. Hist., 110, 1888 (*Beaver Cr., Tenn.*); Bollman, Ent. Amer., 7, 1888 (*Arkansas*).

1847.—*Scolopendropsis helvola* Koch. Syst. Myr., 175 (*North America*); Koch, Die Myr., II, 34, Tab. LXXVI, f. 156, 1863.

1886.—*Scolopocryptops georgicus* Meinert. Proc. Amer. Phil. Soc., 180 (*Georgia*); Underwood, Ent. Amer., 63, 1887.

Habitat.—Massachusetts to Florida and Texas, west of the mountains replaced by variety *spinicaudus*.

Etymology.—*Sex*, six; *spinosus*, spiny.

Comparisons of northern and southern specimens show, as we proceed southwards, the following differences:

(1). An increase in size, especially in the anal legs, which are more slender.

(2). An increase in size in the femoral spines of anal legs.

(3) A tendency among some of the more southern specimens for the coxæ of the prehensorial legs to become dentate.

(4) A tendency for the lateral margins of anal segment to become more callous and slightly serrulate.

(5) An increase in the density of the general coloration and an increase in the paleness of the anal legs beneath.

The following table shows the increase in size of the anal pair of legs:

Habitat.	Total length.	Length of anal.
	mm.	*mm.*
Winona, Minn.	45	7.8
Chicago, Ill.	37	8.4
Bloomington, Ind.	50	9.4
Baltimore, Md.	32	7.7
Chapel Hill, N. C.	48	11.5
Mossy Creek, Tenn.	55	17.
Little Rock, Ark.	42	10.7
Eagleton, Indian Ter.	58	14.6
Indian Springs, Ga.	65	18.
Do	35	7.7
Pensacola, Fla.	35	10.

The increase in length of legs is more noticeable in specimens from the southeast portion of the United States, while toward the southwest they tend to be more like the northern.

As all my specimens from Pensacola are small I have compared them with one of the same size from Georgia.

Some specimens from Winona and Chicago have the interior spine of anal legs absent.

The specimen from Baltimore has the tibia and tarsi of anal legs pilose, the hairs being much longer than those of other specimens; the other legs are rather sparsely pilose.

Those from Indian Springs seem to represent *Scolop. georgicus* of Meinert; although the anal legs are longer, the first 4 dorsal plates immarginate, and the prosternum slightly dentate, I believe it should not be considered as a good species.

14*b*. Scolopocryptops sexspinosus spinicaudus.

1862—*Scolopocryptops spinicauda* Wood. Journ. Acad. Nat. Sci. Phila., 39 (*Shoal Water Bay, W. T.; Oregon*); Wood, Trans. Amer. Phil. Soc., 174, 1865; Wood, Proc. Acad. Nat. Sci. Phila., 128, 1867 (*San Jose, Cal.*).

Habitat.—Shoal Water Bay and Chehalis, W. T.; Oregon; San José and San Mateo, California.

Etymology.—Latin, *spina*, spine; *cauda*, tail.

A careful examination of two specimens of *sexspinosus* from Chehalis, W. T., proves, as Dr. Wood has previously shown, that the western and eastern specimens should be separated. The main difference lies in the hirsuteness of the first antennal joints; the differences mentioned by Wood are hardly sufficiently distinct to separate the two forms.

15. Scolopocrytops nigridius.

1887—*Scolopocryptops nigridius* McNeill. Proc. U. S. Nat. Mus., 333 (*Bloomington, Ind.*); Bollman, Ann. N. Y. Acad. Nat. Sci., 107, 1888 (*Knoxville, Tenn.*); Bollman, *ibid.*, 110 (*Beaver Cr., Tenn.*); Bollman, *ibid.*, 112 (*Mossy Cr., Tenn.*).

Habitat.—Monongahela City, Pa.; Bloomington, Greencastle, Salem, Indiana; Chapel Hill, N. C.; Beaver Creek, Mossy Creek, Knoxville, Tenn.

Etymology.—Latin, blackish.

For the sake of completeness I give the following description of *nigridius.*

Head, antennæ, first and last dorsal segments reddish brown; other parts greenish brown; legs paler, with the femoral and tibial joints of the posterior pairs turquoise-green beneath. Moderately robust; sparsely pilose; rather densely punctate, especially on head. Antennæ rather short, articles rather long, all except the first two densely hirsute. Coxæ of prehensorial legs strongly callous, sinuate; coxal tooth short and blunt. Anal legs short, tarsi densely pilose as in *gracilis*; inferior spine large, interior small. Tarsi of anal and penultimate pairs of legs unarmed, second tarsal joint, except that of the last four pairs of legs, armed above. All the dorsal plates except the first three marginate; two indistinct short sulci on the posterior part of the segment. Anal pleuræ scabrous, densely porous; spine large, robust. Anal sterna wide, sides slightly rounded, posterior margin emarginate. Length 25–40^{mm}; length of anal legs 6–9^{mm}.

This is the species mentioned by Cope (Proc. Amer. Phil. Soc., 179, 1869) as an undescribed *Scolopocryptops* with a "*greenish body and a reddish head.*"

16. Scolopocryptops gracilis.

1862.—*Scolopocryptops gracilis* Wood. Journ. Acad. Nat. Sci. Phila., 38 (*Ft. Tejon, Cal.*); Wood, Trans. Amer. Phil. Soc., 173, 1865.

1862.—*Scolopocryptops lanatipes* Wood. Journ. Acad. Nat. Sci. Phila., 39 (*California*); Wood, Trans. Amer. Phil. Soc., 175, 1865; Kohlrausch, Archive Naturg., 56, 1881; Underwood, Ent. Amer., 62, 1887.

1870.—*Scolopocryptops californica* Humbert & Saussure. Rev. & Mag. Zool., 204 (*California*); Humb. & Sauss., Miss. Sci. Mex., 1872.

Habitat.—Upper and Lower California.

Etymology.—Latin, slender.

Recent writers have used the name *lanatipes* for this species; but, as *gracilis* preceded *lanatipes* in Wood's monograph, it should be employed.

RECAPITULATION.

The following is a list of the genera and species of *Scolopendridæ* now recognized by me as occurring in North America north of Mexico.

Subfamily I.—CRYPTOPINÆ.

1. Cryptops Leach.

1. *Cryptops hyalinus* Say.

2. Theatops Newport.

2. *Theatops posticus* (Say).
3. *Theatops spinicaudus* (Wood).

Subfamily II.—SCOLOPENDRINÆ.

3. Scolopendra Linnæus.

(*Scolopendra.*)

4. *Scolopendra dehaani* Brandt.
5. *Scolopendra subspinipes* Leach.
6. *Scolopendra morsitans* L.
7. *Scolopendra woodi* Meinert.
8. *Scolopendra pachypus* Kohlrausch.
9. *Scolopendra viridis* Say.
10. *Scolopendra heros* Girard.

(*Collaria.*)

11. *Scolopendra crudelis* Koch.

4. Rhysida Wood.

12. *Rhysida celer* (Humbt. & Sauss.).

Subfamily III.—SCOLOPENDROPSINÆ.

5. Scolopocryptops Newport.

13. *Scolopocryptops miersi* Newport.
14. *Scolopocryptops sexspinosus* (Say).

14*b*. *Scolopocryptops sexspinosus spinicaudus* (Wood).

15. *Scolopocryptops nigridius* McNeill.
16. *Scolopocryptops gracilis* Wood.

INDIANA UNIVERSITY, *Bloomington, Ind., June 15, 1889.*

A LIST OF THE MYRIAPODA OF MINNESOTA.*

BY CHARLES H. BOLLMAN.

The following list of myriapods of the State of Minnesota is based upon the material in my collection, which has been collected at two points, Fort Snelling and Winona.

Before I began my study of the myriapods of Minnesota, only one species (*Linotænia chionophila*) was reported from this State. In this paper I have recorded twenty-five species as occurring within the limits of the State. I wish to express my indebtedness to Messrs. W. D. and G. M. Howe for the material from Fort Snelling, and to Mr. J. M. Holzinger, of the State Normal, for the material from Winona.

A.—Fort Snelling.

The material from this place was collected during the summers of 1886 and 1887. On account of the dry seasons the collections were small; in fact, only nine species were obtained, against twenty-four from Winona.

1. Parajulus diversifrons (Wood).

Julus sp.? Wood. Proc. Acad. Nat. Sci. Phila., 10, 1864 (Illinois); Wood, Trans. Amer. Philos. Soc., 197, 1865.
Julus diversifrons Wood. Proc. Acad. Nat. Sci. Phila., 43, 1867 (Texas).
Julus diversifrons Borre. Ann. Soc. Ent. Belg., 54, 1884.
Parajulus castaneus Bollman. Ent. Amer., 21, 1887 (Ft. Snelling, Minn.); Bollman. Ann. N. Y. Acad. Sci., 35, 1887.

Besides the two type specimens of *castaneus* only a few were afterwards found.

2. Parajulus ellipticus Bollman.

Julus ellipticus Bollman. Amer. Nat., 82, 1887 (Ft. Snelling, Minn.).
Parajulus ellipticus Bollman. Ann. N. Y. Acad. Sci., 35, 1887.

The types of *ellipticus* were the only specimens obtained.

3. Campodes flavicornis Koch.

I have seen several specimens which agree well with those from more southern and eastern localities, but the majority of specimens are small (8–10^{mm}) and strongly resemble *Chordeuma*.

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*This and the two following papers were brought to my attention some four years after the preceding material had been passed upon by Dr. Underwood. It happened that Mr. O. F. Cook was in Washington when the papers were found, and he considered them equally worthy of publication with the others.—C. V. Riley, *Honorary Curator.*

4. Scytonotus granulatus (Say).

Not uncommon.

5. Polydesmus serratus Say.

Polydesmus serratus Say. Jour. Phila. Acad. Nat. Sci., 106, 1820 (*Virginia*); Gervais, Aptères, IV, 105, 1847; Gervais, Cast. Exp. l'Amér. Sud. VII, Myr. and Scorp., 6, 1856; Saussure, Mex. Myr., 67, 1860 (*South Carolina*); Peters, Monastb. kön. preuss. Akad. Wiss., 539, 1864 (*Pennsylvania*).

Polydesmus canadensis Newport. Ann. and Mag. Nat. Hist., 265, 1844 (*Hudson's Bay*); Gray, Cat. Myr. Brit. Mus., 16, 1844; Gervais, Aptères, IV, 106, 1847; Gervais, Cast. Exp. l'Amér. Sud, 6, 1859; Wood, Trans. Amer. Philos. Soc., 216, 1865 (*Pennsylvania*, etc.).

Polydesmus glaucescens Koch. Syst. Myr., 133, 1847 (*N. A.*); Koch, Die Myr., I, 59, f. 51, 1863.

Polydesmus pennsylvanicus Koch. Syst. Myr., 133, 1847 (*Pennsylvania*); Koch, Die Myr., II, 18, t. 69, f. 142, 1863.

Not syn.—*Poly. serratus* Wood. Trans. Amer. Philos. Soc., 215, 1865 (*P. moniliaris* Koch).—*Poly. canadensis* McNeill, Proc. U. S. Nat. Mus., 324, 1887 (*Pensacola, Fla.; P. nitidus* Bollman). *Poly. canadensis* Bollman, Ann. N. Y. Acad. Nat. Sci., 107, 1888 (*Knoxville, Tenn.; P. branneri* Bollman).

In this paper I have regarded *Poly. canadensis* as representing the true *serratus* of Say. The *Poly. serratus* of Wood, which has the lateral carinæ finely serrate, is probably *Poly. moniliaris* Koch.

6. Fontaria virginiensis brunnea Bollman.

Fontaria virginiensis brunnea Bollman. Amer. Nat., 82, 1887 (Ft. Snelling, Minn.).

Besides the type, I afterwards received another specimen that was not in color.

7. Geophilus bipuncticeps Wood.

One female was found in the collections.

8. Lithobius minnesotæ Bollman.

Lithobius minnesotæ Bollman. Amer. Nat., 81, 1887 (Ft. Snelling, Minn.); Bollman, Proc. U. S. Nat. Mus., 255, 1887.

Only the type of this species was obtained.

9. Lithobius howei Bollman.

Lithobius howei Bollman. Amer. Nat., 81, 1887 (Ft. Snelling, Minn.); Bollman, Proc. U. S. Nat. Mus., 254, 1887.

Only the type specimen was found. This species is closely related to *politus* McNeill, but until good material can be obtained it will be best to let it stand as it is.

B.—WINONA.

The collections received from this locality were made during 1886 and 1887. As the material was collected at all suitable times in the year, I have been enabled to present a rather exhaustive list of the myriapods of this vicinity.

The greater bulk of the material consisted of specimens of *Lithobius forficatus*.

1. Parajulus venustus Wood.

Julus venustus Wood. Proc. Phila. Acad. Nat. Sci., 10, 1864 (*Illinois*).
Julus venustus Preudhomme de Borre. Ann. Soc. Ent. Belg., 62, 1884.
Julus impressus Wood, etc.

In this paper I have regarded the *Julus venustus* of Wood as representing a valid species and not identical with *impressus*, as Wood himself and other writers have later held.

In the Trans. Amer. Phil. Soc., 196, 1865, Wood makes *venustus* and *impressus* the same, and mentions a specimen from Georgia. I regard the specimens from Georgia as the true *impresus*, which is found in Indiana, Georgia, and Florida, while *venustus* is found in Colorado, Kansas, Minnesota, Michigan, Illinois, and Indiana.

2. Parajulus diversifrons (Wood).

Common.

3. Parajulus ellipticus Bollman.

This is a very common species, if not even abundant.

4. Lysiopetalum lactarium (Say).

Several specimens were sent in the last collection.

5. Campodes flavicornis Koch.

Not uncommon. Most of specimens sent were very young.

6. Craspedosoma atrolineatum Bollman.

A single female from here seems to agree in all the principal characters with the types of *C. atrolineatum*, which are from British Columbia.

7. Leptodesmus borealis, sp. nov.

Anterior parts of segments reticulated with black, posterior border, lateral carinæ, legs and antennæ yellow, an indistinct, broad, black median, dorsal line. Body robust, narrow, strongly subterete. Vertex smooth, sulcus extending to base of antennæ, setigerous foveolæ. Antennæ short and filiform. First segment semicircular, sides slightly margined, posterior border somewhat emarginate. Other segments more or less corrugate, especially above lateral carinæ. Lateral carinæ small, thick, anterior border not prominent, rounded, posterior scarcely angulated, but produced posteriorly into thick, short, rounded lobes. Mucro of last segment large and thick. Repugnatorial pores moderately large, lateral and subapical. Legs moderately long, extending beyond sides of body. Length of body ♀, 23.5^{mm}; width and height, 3^{mm}; length of antennæ, 2.4^{mm}.

Leptodesmus borealis differs from all the species found in Eastern United States by its thick lateral carinæ and the strongly terete body. It approaches more to *L. eruca* (Wood) from Oregon.

The above description is based on a female, which was collected near Winona by Prof. Holzinger in the fall of 1887.

As this is the most northern species of the genus that has been found, I have given it the specific name of *borealis*.

8. Euryurus evides Bollman.

Paradesmus evides Bollman. Ent. Amer., 229, 1887 (Winona, Minn.).

Very common.

9. Scytonotus granulatus (Say).

Not common.

10. Polydesmus serratus Say.

Very common.

11. Fontaria virginiensis brunnea Bollman.

Common.

12. Linotænia fulva (Sager).

Common.

13. Geophilus urbicus Meinert.

Geophilus gracilis Harger. Amer. Journ. Sci. and Arts, 118, 1872 (New Haven, Conn.; *preoccupied*).

Geophilus urbicus Meinert. Proc. Amer. Philos. Soc., 218, 1856 (Cambridge, Mass.).

Prof. Holzinger has sent me a male in a tolerably good condition which I refer to this species. As *G. gracilis* Harger is preoccupied, *urbicus* Meinert must take its place.

14. Geophilus setiger Bollman.

Geophilus setiger Bollman. Ent. Amer., 82, 1887 (Salem, Ind.).

There is a male in the collection that agrees perfectly well with the types of this species.

15. Geophilus foveatus (McNeill).

Mecistocephalus foveatus McNeill. Proc. U. S. Nat. Mus., 325, 1887 (*Pensacola, Fla.; name only*); McNeill, Proc. U. S. Nat. Mus., 333, 1887 (Bloomington, Ind.).

There is one specimen that agrees with those from more southern localities.

16. Geophilus bipuncticeps Wood.

Common.

17. Scolopocryptops sexspinosus (Say).

Common. These specimens differ from all known to me from other localities in most times having the spine on the inner sides of anal legs obliterated; otherwise they are identical.

18. Henicops fulvicornis (Meinert).

I have seen about a dozen specimens, more or less mutilated as to antennæ and legs, so that very much can not be ascertained with certainty, but they seem to agree with the published descriptions. This makes the third locality from which specimens have been reported in North America.

19. Lithobius tuber Bollman.

Not common.

20. Lithobius holzingeri Bollman.

Lithobius holzingeri Bollman. Ent. Amer., 83, 1887 (Winona, Minn.).

Common.

21. Lithobius bilabiatus Wood.

Not common.

22. Lithobius forficatus (Linné).

This is the most abundant myriapod around Winona, as is indicated by the numerous specimens received.

23. Lithobius howei Bollman.

Rare.

24. Lithobius mordax Koch.

Rare.

Specimens from the northern localities differ from those from other places by having the anal legs more flattened and shorter.

INDIANA UNIVERSITY, *June 1, 1888.*

NOTES ON THE POLYZONIIDÆ.

BY CHARLES H. BOLLMAN.

1841.—*Ommatophora* Brandt. Recueil, 89 (*Polyzonium*).
1841.—*Typhlogena* Brandt. Recueil, 50 (*Siphonophora*).
1844.—*Polyzonidæ* Gervais. Ann. Sci. Nat., 3, ser. zool., II, 70 (*Polyzonium*).
1844.—*Polyzoniden* Koch. Syst. Myr., 61 and 142 (*Polyzonium*).
1847.—*Polyzonides* Gervais. Aptères, IV, 203 (*Polyzonium*).
1865.—*Polyzoniidæ* Wood. Trans. Amer. Phil. Soc., 248 (*Polyzonium*).
1869.—*Andrognathidæ* Cope. Proc. Amer. Phil. Soc., 182 (*Andrognathus*).

The characters of the family are the same as those of the order *Colobognatha.*

Analysis of the subfamilies of Polyzoniidæ.

* Gnathochilarium represented by an acute triangular plate; dorsal plates not sulcate nor covered with short stiff hairs; lateral carinæ not well developed. POLYZONIINÆ.—A.

** Gnathochilarium subsimilar to that of the *Julidæ*; dorsal plates medianly and transversely sulcate, covered with numerous short hairs; lateral carinæ well developed ..... PLATYDESMINÆ.—B.

A.—POLYZONIINÆ.

1841.—*Ommatophora* Brandt. Recueil, 49.
1844.—*Siphonophoridæ* Newport. Trans. Linn. Soc., 278.
1872.—*Polyzonia* Humbert & Saussure. Miss. Sci. Mex., VI, 99.
1887.—*Polyzonii* Pocock. Ann. and Mag. Nat. Hist., 225.

I.—POLYZONIUM.

1834.—*Polyzonium* Brandt. Oken's Isis, 704 (*germanicus*).
1836.—*Platyulus* Gervais. Bull. Soc. Phil. Paris, 71 (*audouinii* = *germanicum*).
1839.—*Leiosoma* Victor. Bull. Nat. Moscou, 44, Pl. 1 (*rosea* = *germanicum*).
1870.—*Petaserpes* Cope. Trans. Amer. Ent. Soc., 65 (*rosalbum*).
1880.—*Hirudisoma* Fanzago. Bull. Soc. Ent. Ital., 276 (*pallidum*).
1887.—*Hexaglena* McNeill. Proc. U. S. Nat. Mus., 328 (*rosalbum*).
1888.—*Hexoglena* McNeill. Bull. Brook. Soc. Nat. Hist., III, 188.

Body wide, depressed, elongate-oblong; convex above, slightly concave beneath; not pilose. Head distinctly rostrate, partly concealed under the first dorsal plate. Antennæ subclavate, bases approximate, articles subequal. Ocelli present, 2–4, arranged in two diverging series between the bases of antennæ. Mandibles small, triangular. Gnathochilarium much degenerated; stipes apparently deeply bifid, acuminate; lingual lobes well developed; promentum small, ovate; mentum, hypostoma and cardo not developed. Dorsal plates smooth, not sulcate or tuberculate, first arcuate, advanced forward to the base

of the antennæ. Anal segment — — —. Anal valves small, smooth; anal scale absent. Lateral carinæ — — —. Repugnatorial pore beginning at the fifth segment.

Polyzonium rosalbum.

Petaserpes rosalbus Cope. Trans. Amer. Ent. Soc., 65, 1870 (Cumberland Mountains, Tenn.).
Hexaglena cryptocephala McNeill. Proc. U. S. Nat. Mus., 328, 1887 (Bloomington, Ind.).

OCTOGLENA.

1864.—*Octoglena* Wood. Proc. Phila. Acad. Nat. Sci., 186 (*bivirgata*).

If we can trust the figures of Wood showing the head and a few segments of *Octoglena bivirgata*, this genus differs from *Polyzonium* by having the first segments marginate and not concealing the ocelli.

If his figures are not trustworthy *Octoglena* is equal to *Polyzonium*.

This genus contains the following species:

Octoglena bivirgata.

Octoglena bivirgata Wood. Proc. Phila. Acad. Nat. Sci., 186, 1864 (*Georgia*); Wood, Trans. Amer. Phil. Soc., 229, 1865.

B.—PLATYDESMINÆ.

1860.—*Platydesmii* Saussure. Myr. Mex., 83.
1872.—*Platydesmia* Humbert and Saussure. Miss. sci. Mex., VI, 99.
1884.—*Dolistenia* Latzel. Myr. Öst.-Ungar. Monarch., II, 362.
1887.—*Platydesmini* Pocock. Ann. and Mag. Nat. Hist., 225.

Analysis of the genera of Platydesminæ.

a. Body narrow, filiform; mentum rectangular; hypostoma not well developed; anal scale absent; segments not tuberculate.
  b. Fifth segment normal, pores not carried on a pedicel..... DOLISTENUS.
  bb. Lateral carinæ of fifth segment large, deeply sinuate, anterior lobe directed forwards and bearing the repugnatorial pore, which is raised on a short pedicel; other pores on a pedicel but opening on the posterior half of segments.....ANDROGNATHUS.—III.
aa. Body wide, depressed; mentum hammer-shaped; hypostoma well developed; anal scale present; segments tuberculate.....PLATYDESMUS.—IV.

ANDROGNATHUS COPE.

1869.—*Androgna*thus Cope. Proc. Amer. Phil. Soc., 182 (*corticarius*).

Body narrow, fifiform, convex above and below, covered with numerous short hairs. Head not rostrate (mouth parts not adapted for sucking), not concealed by first dorsal plate, densely pilose. Antennæ clavate, short. Ocelli absent. Gnathochilarium well developed, stipes acuminate, destitute of mola and teeth; hypostoma rectangular; cardo rather long and narrow, triangular; mentum rectangular; promentum elongate-ovate; lingual plates, acuminate, separate, destitute of lobes. Dorsal plates medianly sulcate, not tuberculate. First dorsal plate

moderately ovate, the first four dorsal plates smaller than the succeeding. Anal segment large, not tuberculate, inclosed between the lateral carinæ of penultimate; anal valves smooth; anal scale absent. Lateral carinæ large, angulated; the fifth deeply emarginate, bilobed. Repugnatorial pores born on a pedicel, placed on the anterior lobe of fifth lateral carinæ, but supapical on the rest. Legs extending beyond sides of body.

Androgna thus is closely allied to the European genus *Dolistenus* Fanzago, but the later genus is separated from *Androgna thus* by the form of the fifth segment and of the repugnatorial pores.

This genus contains the following species:

Androgna thus corticarius.

Androgna thus corticarius Cope. Proc. Amer. Phil. Soc., 182, 1869 (*Montgomery Co., Va.*); Bollman, Ann. N. Y. Acad. Sci., 108, 1888 (*Beaver Cr., Tenn.*).

Yellowish brown, legs and under parts paler. Segments 40–60, first four smaller than the succeeding. Lateral carinæ strongly developed, more aliform posteriorly. Repugnatorial pore large, placed on the anterior lobe of fifth segment, but posterior and almost subapical on the others. Male: Anterior legs with claws normal. Length of body 10–20^{mm}.

Habitat.—Montgomery Co., Va. (Cope); Mossy Creek, Strawberry Plains, and Beaver Creek, Jefferson County, Tennessee.

PLATYDESMUS.

1843.—*Platydesmus* Lucas. Ann. Soc. Ent. France, 51 (*polydesmoides*).
1849.—*Piestodesmus* Lucas. Rev. et Mag. Zool., 589 (*moreleti*).
1864.—*Brachycybe* Wood. Proc. Phila. Acad. Nat. Sci., 187 (*lecontei*).

Body wide depressed, elongate-oblong, covered with numerous short hairs; convex above and below. Head not suctatorial nor concealed by the first dorsal plate, densely pilose. Antennæ slightly clavate, second article longest, bases remote. Ocelli absent. Mandibles small, triangular, two-toothed and pilose on the inner side.

Gnathochilarium well developed; stipes large, mala and teeth not well developed; hypostoma as in *Pseudodesmus;* cardo present; mentum hammer-shaped; promentum small, elongate orate; lingual plates touching, lingual lobes distinct. Dorsal plates medianly sulcate, with two transverse rows of non-pilose tubercles. Lateral carinæ large, those of the first ten directed forwards. Anal segment tuberculate, included between the lateral carinæ of penultimate; anal valves smooth; anal scale present. Repugnatorial pore beginning at fifth segment, and nearer the anterior margin than the others. Legs not extending beyond sides of body.

Platydesmus, *Piestodesmus*, and *Brachycybe* agree in all points except as to the possession of ocelli—*Piestodesmus* has two, *Platydesmus* one,

and *Brachycybe* has none, but until a satisfactory examination can be made of the eyes, it is not best to rank any even as subgenera.

The so-called vitreous ocellus of *Platydesmus* seems to me to be nothing but a slight swelling of the head behind the antennæ. This genus contains the following species:

Platydesmus lecontii.

Brachycybe lecontii Wood. Proc. Phila. Acad. Nat. Sci., 187, 1864 (*Georgia*); Wood, Trans. Amer. Phil. Soc., 230, 1865.
Brachycybe lecontei Cope. Trans. Amer. Ent. Soc., 66, 1870 (*Jefferson Co., Tennessee*).
Platydesmus lecontei Bollman. Ent. Amer., 1, 1888 (*Little Rock, Arkansas*); McNeill, Bull. Brook. Soc. Nat. Hist., No. 3, 4, 1888.
Brachycybe rosea Murray. Econ. Ent. Aptera, 21, 1877 (*California*).
Platydesmus rosea McNiell. Bull. Brook. Soc. Nat. Hist., No. 3, 4, 1888.
Platydesmus californicus Karsch. Mittheil. Münch. Ent. Ver., 144, 1880 (*California*).

Segments rosy, with the lateral carinæ paler; legs, antennæ, and head principally yellow. Segments 35–55; first row of tubercles near the anterior margin, along the middle of segment, but ending at the repugnatorial pore; second row arranged along posterior margin of segment. Lateral carinæ rounded or slightly irregular in outline.

Repugnatorial pore small; swelling small, placed near the middle and slightly sinuate. Anal segment armed with 4–8 setigerous tubercles. Male: Anterior pair of legs scarcely larger than the rest; claws normal. Anterior copulation foot 6-jointed, rather abruptly curved downwards and ending in a small claw; second copulation foot bent in between the first, 6-jointed, ending in four or five long and stiff bristles. Length of body, 8–21^{mm}.

Habitat.—Tallulah, Georgia; Little Rock and Magnet, Arkansas; Georgia (Wood); Jefferson County, Tennessee (Cope); California (Murray and Karsch).

I have been unable to find any differences between *P. lecontei* and *rosea* or *californicus;* especially Karsch's description of the latter, for Murray's description of *rosea* is so meager that it is almost impossible to identify his species with any of the others.

A careful study of the male copulation foot of the Eastern and Western forms may reveal some differences.

NOTES UPON A COLLECTION OF MYRIAPODS BELONGING TO THE U. S. NATIONAL MUSEUM.

BY CHARLES H. BOLLMAN.

The following notes are a continuation of the paper which appeared in the Proceedings of the Museum for 1888 (pp. 343–350). In this part is given an account of the foreign material in the same collection.

The following is a key to the seven species of *Spirobolus* mentioned in this paper:

a. Scobina absent (*subgenus Spirobolus*).
  b. Repugnatorial pore opening on posterior division of segments....GRACILIS.—1.
  bb. Repugnatorial pore opening on anterior division of segments.
    c. Segments divided by a transverse sulcus.
      d. Sulcus obliterated above; clypeal foveolæ 3+3 or 3+4..CALLIPUS.—2.
      dd. Sulcus literated above; clypeal foveolæ 5+5.....BAHAMENSIS.—3.
    cc. Segments not divided by a distinct transverse sulcus; foveolæ 2+2. SURINAMENSIS.—4.
aa. Scobina present (*subgenus Rhinocrinus*).
      e. Anal segment produced into a large, flat mucro.
        f. Anterior part of segments without a transverse sulcus; segments 51–56 CAUDATUS.—5.
        ff. Anterior part of segments with a transverse sulcus; segments 46–48. ZONIPUS.—6.
      ee. Anal segments produced into a long, sharp mucro.....DUGESI.—7.

1. Spirobolus gracilis, sp. nov.

Diagnosis.—Related to *Spirobolus brandti* Karsch, but the dorsum of each segment smooth and sparsely punctate; anterior part of segments showing concentric striæ beneath; first segment with subacute sides which have three striæ.

Habitat.—Paramaribo, Surinam.

Type.—Female, U. S. Nat. Museum.

Description.—Female. Greenish black, posterior border of segments brownish; legs and antennæ dark. Slender, anterior segments scarcely attenuated. Vertex smooth, sulcus short and shallow; a depression between eyes; clypeus rather rough, not deeply excised, foveolæ 2+2, close together, above a transverse line. Antennæ short and thick, reaching second segment. Ocelli 43–45, the 6 rows forming a suboval patch. Segments smooth, sparsely punctate; posterior part with oblique striæ beneath; anterior part showing several concentric striæ beneath, but which above disappear under the preceding segment. Sides of first segment subacute, with 3 striæ; anterior border slightly excised. Repugnatorial pore moderate, placed about on the anterior

third of posterior half of segment. Anal segment obtuse, not projecting beyond valves; anal valves more strongly compressed than in *brandti*, densely punctate, especially above; anal scale slightly angulated. Legs short, not quite extending beyond sides of body. Segments 54–59. Length 50–55^{mm}; width, 4–4.3^{mm}.

This species is described from two specimens which I found amongst a large number of *S. surinamensis* without any locality; but as there was another vial of *surinamensis* labelled "*Surinam*" I am inclined to believe that this species is from the same locality. *S. vulvanus* Karsch, the only other American species having the repugnatorial pore on the posterior half of segment, has 3+3 or 4+4 clypeal foveolæ.

2. Spirobolus callipus, sp. nov.

Diagnosis.—Related to *Spirobolus brevicollis* Voges, but the clypeal foveolæ 3+3 or 4+3; segments 43–47; ♂ coxæ of 3, 4, 5, 6 pairs of legs produced; tarsæ without a polster.

Habitat.—Guanajuato, Mexico; Dugès.

Type.—Male and female, U. S. Nat. Museum.

Description.—Male and female. Ochraceous, posterior border of segments dark; antennæ and legs brown, joints ringed with white. Robust, anterior segments scarcely attenuated. Vertex moderately smooth, sparsely punctate and very slightly reticulated, sulcus short, not very shallow; clypeus transversely wrinkled, not very deeply excised, foveolæ 3+3 or 3+4, sulcus large, extending to opposite base of antennæ. Antennæ almost filiform, not extending beyond second segment; that of the female slightly shorter. Ocelli 30–36 in 5 or 6 series; patch subtriangular. Segments not striate or wrinkled above, but densely punctate; posterior part beneath with almost straight striæ, those on anterior part more oblique, forming an obtuse rounded angle in connection with those on posterior part. Sides of first segment subacute, no striæ except marginal; anterior border subexcised. Repugnatorial pore small, touching sulcus, which is bent forwards; behind pore on posterior part a deep sulcus. Anal segment subacute, not extending beyond anal valves; anal valves moderately margined, punctate; anal scale large, obtusely angled. Legs short, not extending beyond sides of body. Segments female, 43; male, 47.

Male less robust than female; coxæ of 3, 4, 5, 6 pairs of legs produced, that of third largest and curved backward, the rest short; coxæ of second pair large; tarsi without a pad or other markings. Copulation foot very different from that of *brevicollis*, resembling that of *S. americæ-borealis;* ventral plate obtusely angled, one-half as high as foot; inner part of anterior foot pointed and covered with numerous short, round truncate tubercles, outer part with its end curved outwards, not tuberculate; posterior foot hook-like, pointed, its anterior surface tuberculate. Length, 58^{mm}; width, 6.5^{mm}.

Spirobolus callipus is described from two specimens, male and female. This species, although agreeing with the Mazatlan species in many particular points, possesses a copulation foot which is very different.

3. Spirobolus bahamensis, sp. nov.

Diagnosis.—Related to *Spirobolus multiforus* Karsch, but larger and more robust; segments 48; above blackish, beneath yellow.

Habitat.—San Salvador, Bahamas; U. S. Fish Commission.

Type.—Male, U. S. Nat. Museum.

Description.—Male. Above shining black-brown, slightly greenish anteriorly; beneath yellowish, the yellow extending up along posterior border of segments, the black along anterior; vertex greenish; antennæ dark, legs paler. Robust, anterior segments attenuated. Vertex smooth, sulcus subcontinuous with clypeal; clypeus not deeply exised, foveolæ 5+5. Antennæ subclavate, reaching second segment. Ocelli 48, in 7 series, patch subtriangular. Segments visibly divided below repugnatorial pores, above which the dividing line fades out; smooth, sparsely and lightly punctate; obliquely striate beneath. Sides of first segment narrowed, subacute, a marginal sulcus. Repugnatorial pore moderate, opening on antèrior part, touching sulcus, which is bent. Anal segment slightly pointed, not passing valves; anal valves margined, punctate; anal scale rounded, transverse. Legs moderate, scarcely extending beyond sides of body. Segments 48.

Male: Coxæ of third and fourth pairs of legs slightly produced, the latter longer and more pointed; coxæ of fifth pair much longer, flattened and curved over the coxæ of sixth pair which are shorter and blunt; coxæ of seventh pair produced into large and heavy lobes; tarsi of legs without a pad; sixth and seventh segments swollen beneath. Length, 70^{mm}; width, 8.5^{mm}.

Described from an adult male. In the pattern of coloration this species shows a great variation from the others of the genus. No doubt when it is compared carefully with specimens of *multiforus* not much resemblance will be found between the two.

3. Spirobolus surinamensis, sp. nov.

Diagnosis.—Related to *Spirobolus dominicæ* Pocock. Segments without a transverse sulcus, their surface with numerous horseshoe-like depressions.

Type.—Male and female, U. S. Nat. Museum.

Habitat.—Paramaribo, Surinam.

Description.—Reddish brown, antennæ, legs and posterior border of segments brighter. Moderately slender, anterior segments slightly attenuated; vertex rough, sulcus short, ending in a slight depression; clypeus rather deeply excised, sulcus deep, foveolæ 2+2, distant. Antennæ short and thick, reaching past first segment. Ocelli 35–45, in 6 or 7 series; patch subtriangular. Segments not distinctly divided,

a depression occupying sulcus; rough, anterior part closely obliquely striate beneath, above, especially on anterior part, and along the depression, numerous horseshoe-like depressions. Repugnatorial pore large, placed on anterior part, a deep sulcus behind. Anal segment slightly angulated, not passing valves; anal valves scarcely margined, sparsely punctate; anal scale almost transverse. Legs extending slightly beyond sides of body. Segments, female, 51–53; male, 51.

Male: Less robust than female; coxæ of second pair of legs large, coxæ of other legs not produced; femur with a slightly swollen ovate knob; last tarsal joint with an elongate sucker; sixth and seventh segments swollen beneath; ventral plate of copulation foot convex, one-half as high as foot, apex bifid; anterior copulation foot short and heavy, outer part plain, curling around inner, end slightly pointed, inner part heavy, its inner margin slightly concave, a small wing on its anterior surface; posterior copulation foot somewhat hook-like, its end rounded and slightly bifid; on the inner side are three lobes; the first is large and moderately flat, with its entire surface granulated; the second is spine-like and arises just above the first; it is twisted, tapering, with its outer surface very rough; it ends near the beginning of third, which is flat and bent basalwards, its end concave. Length, 40–50^{mm}; width, 4–5^{mm}.

This species seems to bear little resemblance to any other from America. It probably comes nearest to *S. dominicæ*, as shown by the form of the posterior copulation foot, but the rest of the copulatory organ is entirely different.

In the collection is one specimen labelled "Surinam," and a very large number in another vial without any locality, but which I suppose are from the same place.

5. Spirobolus caudatus Newport.

Spirobolus caudatus Newport. Ann. and Mag. Nat. Hist., 269, 1844 (*Demerara*); *Julus arboreus* Saussure, Linn. Ent., 331, 1859 (*St. Thomas*).

Segments, male, 51–53; female, 51–56; ocelli 40–55, in 6–8 series. Male: Coxæ of none of the legs noticeably produced or any other markings of note about the legs. Ventral plate of copulation foot higher than anterior part of first foot, but not so high as posterior part; its end rather suddenly pointed, slightly truncate. Anterior or inner part of anterior copulation foot pointed; end of posterior part rather blunt and swollen. Posterior foot long and slender, curved outwards and backwards, the only part of copulation foot projecting out of opening; bifid, the upper branch compressed, especially towards the end which is slightly sinuate, its lower angle with a short, slender spine; lower branch lanceolate, not as long as upper, depressed, sides very thin and transparent, edges entire or very slightly sinuate. Ventral part of the anterior half of seventh segment produced into a blunt, triangular lobe.

In the collection are a number of specimens which were obtained by the U. S. Fish Commission at St. Thomas.

6. Spirobolus zonipus, sp. nov.

Diagnosis.—Related to *Spirobolus facatus* Karsch, but the anterior part of segments with a transverse sulcus; segments visibly divided; legs shorter; greenishblack, legs brown, joints ringed with paler.

Type.—Female, U. S. Nat. Museum.

Habitat.—Paramaribo, Surinam.

Description.—Dark greenish black, posterior border of segments yellowish; antennæ dark; legs brownish, last tarsal joint pale, others ringed. Rather slender, anterior segments scarcely attenuated. Vertex smooth, sulcus deep, subcontinuous with clypeal; clypeus not deeply emarginate, sulcus small, foveolæ 2+2. Antennæ short and thick, reaching second segment. Ocelli 40–45, in 7 series; patch subtriangular. Segment smooth, sparsely punctate; anterior part with a transverse sulcus which ends in under pore, not striate beneath; posterior part with short striæ beneath. Sides of first segment rounded, not acute, a marginal sulcus. Repugnatorial pore small, placed on anterior part; sulcus bent. Anal segment produced into a wide, flat, obtusely angled mucro, which passes beyond valves; anal valves scarcely margined, not punctate; anal scale large, obtusely angled. Legs not quite extending beyond sides of body. Segments 46–48. Length, 43–50^{mm}; width, 4–5^{mm}.

Described from several females most of which are broken; they were found in the vial containing *S. surinamensis*, without any locality.

7. Spirobolus dugesi, sp. nov.

Diagnosis.—Related to *Spirobolus lætus* Karsch, but the segments very plainly segmented; striæ not extending beyond the length of legs; shining bluish black.

Type.—Male, U. S. Nat. Museum.

Habitat.—Guanajuato, Mexico; Dugès.

Description.—Dark shining bluish black, posterior border of segments paler; antennæ and legs reddish brown. Slender, anterior segments scarcely attenuated. Vertex smooth, sulcus very shallow; clypeus moderately emarginate, foveolæ 2+2, sulcus shallow, extending to opposite bases of antennæ; between antennæ are two oblique sulci (//\\); antennæ short, clavate, reaching second segment. Ocelli only represented by a black area, in which are indistinct traces of ocelli; colored area subcircular, partly covered by first segment. Segments rather deeply divided, smooth; striæ of posterior part not extending beyond length of legs. Lateral border of first segment rounded, a very short marginal sulcus. Spine of anal segment large and long, tip slightly recurved; anal valves produced in under spine, very strongly margined, a margin extending around anal scale; anal scale large, obtusely angled. Repugnatorial pore rather small, deep set; behind them is a deep sulcus on posterior part of segments. Legs short, not extending beyond sides of body.

Male: Coxæ of third and fourth pairs of legs produced into short, blunt, rounded lobes, that of the third more slender; femur of third and fourth with an oval swelling, that of third largest; ventral part of the posterior half of seventh segment produced into a short triangular plate. Segments 50. Length, 55mm; width, 5mm.

This species is described from a broken male specimen. The copulation foot was not taken out, but what I could see resembles that of *caudatus* and *heilprini*. I have named this species after its collector, Mr. A. Dugès.

8. Spirostreptus otomitus (Saussure).

1859.—*Julus otomitus* Saussure. Linn. Ent., 330 (*Cordova, Vera Cruz, San Andres, Tuxtla, Mexico*).

1884.—*Spirostreptus otomitus* Preudhomme de Borre. Ann. Soc. Ent. Belg., 69.

Acc. 19811, Truxillo, Honduras; C. H. Townsend. ♀.

Number of segments, 63; ocelli 42–5; antennæ reaching third segment; length, 55mm; width, 3.2mm.

9. Spirostreptus surinamensis Brandt.

1841.—*Spirostreptus surinamensis* Brandt. Recueil, 108 (*Surinam*).

1847.—*Julus surinamensis* Gervais. Aptères, IV, 185.

Acc. 14420, New Granada, West Indies; U. S. Fish Comm. Male and female.

Dark brown, anterior part of segments yellowish; antennæ and legs reddish brown. Robust, anterior segments somewhat attenuated. Vertex, especially along margin of first dorsal plate, rough, longitudinal and transverse sulci distinct; clypeus very rough, emargination shallow. Antennæ reaching third segment in both sexes. Ocelli 65–70, in 7 series, arranged in an elongate-oval patch. Segments scarcely segmented, appearing smooth and shining, but densely and very lightly punctate; anterior part with a few concentric striæ; posterior striate beneath, striæ disappearing before pore and forming a row of dot-like marks. Lateral part of first segment tetragonal, slightly produced anteriorly in the male, about 7 distinct sulci. Anal segment obtusely angled, a transverse sulcus; anal valves strongly margined, convex; anal scale almost transverse. Repugnatorial pore small, placed about on anterior third of posterior part. Legs long, extending beyond sides of body. Segments, male, 62; female, 65.

Male: Legs stouter than those of female; first and second tarsal joints with pads; these disappear about the thirtieth segment; ventral plate of copulation foot very small, convex, sulcate, its base concave; anterior copulation foot curled around basal part of posterior, which runs along its anterior surface, end expanded and rounded, with a black, short, pointed, upward and backward projecting lobe at its upper exterior angle, its anterior surface corrugated, that part which curls around posterior foot corrugated and with a few short bristles; posterior foot appearing at upper third of anterior, decurved along its outer edge,

spirally twisted, end expanded, very thin and sinuate; near the point where the foot is decurved there is on its anterior surface a sharp, stout, triangular, downward pointing spine; from the posterior side of foot may be seen a small hooked spine springing from the inner side of fan-shaped end.

The collection contains two specimens which are so broken that I was unable to obtain good measurements.

10. Orthomorpha coarctata (Saussure).

(*Orthomorpha*, nom. gen. nov. for *Paradesmus* Saussure, which is preoccupied by *Paradesmus* Corda, Polyg.)

1860.—*Polydesmus coarctatus* Saussure. Myr. Mex., 39 (*Cayenne*).
1281.—*Polydesmus* (*Paradesmus*) *vicarius* Karsch. Troschel's Archiv f. Naturgesch., 38 (*Mayotti, Aujoani, Africa*).
1887.—*Strongylosoma poeyi* Bollman. Ent. Amer., 82 (*Cuba*).

Two specimens (male and female) were found in a vial containing *Spirobolus surinamensis*, which were identical with a specimen in another vial from Paramaribo, Surinam. As these specimens are from the same region where the types of *coarctatus* were from, I have not hesitated to identify them with that species; in fact, if I had no males the locality would be the principal means of identifying, as it is impossible to separate *gracilis*, *coarctatus*, and *dasys* by any other point than that of the male genitalia. My identifying these specimens with *coarctatus* and considering *vicarius* and *poeyi* identical, as shown by the copulation foot of the males, has led me to study the different species belonging to this group. Herebefore *coarctatus* has been considered identical with *Fontaria gracilis* Koch, from Pulolos, Austria; but as proven by Latzel's figure* of the copulation foot of Austrian specimens, this can not be. *Coarctatus* and *gracilis* have also been considered identical with a certain species from Borneo, Timor, Alinda and Viti-Levu, and a few other East Indian localities; but even these specimens as shown by Karsch's figure† of the male copulation foot, although more allied to *gracilis* than *coarctatus*, are not identical and represent an undescribed species (*O. Karschi*, sp. nov.). On account of these changes and differences the species of *Orthomorpha* should stand as follows:

1. **Orthomorpha coarctata** (Saussure) (=*vicarius*‡=*poeyi*). Habitat: West Indies, Surinam, Brazil, and Africa.
2. **Orthomorpha beaumonti** (Le Guillon) (=*P. spectabilis* Karsch). Habitat: Borneo and Java.
3. **Orthomorpha pekinensis** (Karsch). Habitat: Peking, China.
4. **Orthomorpha flavolimbata** (Guldensteeden and Egeling). Habitat: Japan.

* Die Myr. Öst.-Ungar. Monarch., Taf. VI, fig. 70.

† Troschel's Archiv f. Naturgesch., Taf. III, fig. 7, 1881.

‡ *P. vicarius* Karsch may not be identical with *coarctatus*, as his figure of the male genitalia only shows two points, while in *coarctatus* there are three; but as they are *small*, it is very probable he did not observe the third.

5. **Orthomorpha karschi**, sp. nov. Habitat: East Indies and part of Polynesia.
6. **Orthomorpha gracilis** (Koch). Habitat: Austria (*only found in a few hothouses, and seems to have been introduced*).
7. **Orthomorpha dasys** Bollman. Habitat: Baltimore, Maryland (*introduced, found only in hothouses*).

11. Polylepis klugii (Brandt).

(*Polylepis*, nom. gen. nov. for *Pachyurus* Saussure, which is preoccupied by *Pachyurus* Agass., Pisces, 1829.)

Acc. 18478, Guanajuato, Mexico; Dugès, ♀.

The two American species should now stand thus:

1. **Polylepis klugii** (Brandt).
2. **Polylepis abstrusus** (Karsch).

12. Fontaria fraterna (Saussure).

1859.—*Polydesmus fraternus* Saussure. Linn. Ent., 322 (*Mexico*).
1881.—*Polydesmus* (*Fontaria*) *angelus* Karsch. Troschel's Archiv f. Naturgesch., 39 (*Puebla, Mexico*).

Acc. 17139, Puebla, Mexico; male and female.

These specimens agree in all points with Saussure's description of *fraternus*.

P. angelus may be different (l. 50mm), but its copulation foot is identical with that of the specimens before me, which are the same size of *fraternus*.

13. Fontaria otomita (Saussure).

1859.—*Polydesmus otomitus* Saussure. Linn. Ent., 322 (*Cord. va, Mexico*)

Acc. 18478, Guanajuato, Mexico; Dugès; 4 males, 1 female.

Copulation foot of male subsimilar to that of *fraterna*. Apex bifid; angle between them greater than a right; the upper lobe smallest and pointed; the lower recurved, broader, subtruncate, and is the branch through which the spermatozoa are conveyed; not far below the apex on the interior side is a small triangular spine. Basal spine rather short, cylindrical, its apex curved upwards, separated from rest of foot by a wide angle. Basal part of foot with short, almost spine-like hairs; a few at the upper interior angle much longer.

14. Linotænia chionophila (Wood).

No. 83, U. S. Nat. Museum; Bering Island; Stejneger.

One small broken male, which I have been unable to separate from the American species. Pairs of legs, 43.

15. Scolopendra morsitans Linnæus.

Acc. 14150, Paramaribo, Surinam; U. S. Fish Commission.

16. Scolopendra heros Girard.

1860.—*Scolopendra azteca* Saussure. Myr. Mex., 124.
1860.—*Scolopendra otomita* Saussure. Myr. Mex., 125.
1860.—*Scolopendra maya* Saussure. Myr. Mex., 126.

Acc. 18478, Guanajuato, Mex.: Dugès.

A comparison of this specimen with Saussure's Mexican species has led me to regard the above as synonyms of *heros*.

17. Scolopendra pachypus Kohlrausch.

Acc. 19811, Truxillo, Honduras; C. H. Townsend.

One specimen. It only differs from *pachypus* in size; length, 85mm. All the known *pachypus* are not more than 65mm long.

18. Scolopendra nicaraguensis, sp. nov.

Diagnosis.—Related to *Scolopendra heros* Girard but the anal pair of legs thicker and shorter; first 15 dorsal plates immarginate; last anal plate shorter and wider.

Type.—Acc. 19099, U. S. Nat. Museum.

Habitat.—Nicaragua; Dr. Bransford.

Description.—Dorsal plates dirty yellowish green; legs and under parts yellow; antennæ pale; prehensorial pair of legs dark orange. Moderately robust, smooth, not punctate. Head suboval, punctate; a longitudinal median depression; no sulci. Antennæ rather short, articles 21–24, the first four not hirsute. Prosternal teeth 4+4, rather large, inner coalesced; coxal tooth large, unarmed. The first 15 dorsal plates immarginate; sulci deep; posterior borders not wrinkled. Sulci of ventral plates well marked; last ventral plate short and wide, sides converging, posterior margin truncate. Second tarsal joints of all the legs except anal armed. Anal pair of legs short and thick; spines large, 5–6 in two rows on the superior interior surface, 2 or 3 each on the inner and inferior-interior surfaces, beneath 6–10 in two rows; apical process slender, bifid. Posterior margin of anal pleuræ slightly convex, apex with 3 or 4 spines, also 1 marginal. Length, 90mm.

The collection contains three specimens of this species, of which one is in a good condition. It is distinguished from *pachypus* by having the anal legs less crassate; from *pernix* by having the spines of anal legs less numerous.

19. Scolopendra hirsutipes, sp. nov.

Diagnosis.—Related to *Scolopendra heros*, but the tarsi of anal and penultimate pairs densely and shortly hirsute; spines on the upper interior surface of femora 3 or 4 in two series.

Type.—U. S. Nat. Museum.

Habitat.—West Indian fauna.

Description.—Yellowish brown, posterior margin of dorsal plates

green; legs and antennæ yellow. Robust, smooth, sparsely punctate. Head suboval, punctate; sulci absent. Antennæ long, articles 25–27, crassate at base, the first 5 not hirsute. Prosternal teeth 4+4, rather large, inner coalesced; coxal tooth large, inner margin slightly armed. The first four dorsal plates immarginate, the first without sulci; posterior border not wrinkled; sulci of ventral plates deep; last ventral plate rather short and wide; sides straight, converging; posterior border emarginate. Second tarsal joint of all legs except anal pair armed. Anal pair of legs rather long, stout; spines large; superior-interior margin with 3 or 4, which are arranged in two series; 1 within; 2 on the inferior-interior surface; 5–7 beneath and arranged in two or three series; apical process trifid; tibiæ and tarsi pilose, the latter more densely; tarsi of penultimate pair also pilose; anal pleuræ with its posterior margin concave, pilose; apex rather short, with 4 spines; a marginal spine. Length, 100mm.

One specimen without any locality, but as all others unlabeled in the collection seem to be from Surinam, I suppose this specimen is from the same place.

20. Scolopendra sanatillæ, sp. nov.

Diagnosis.—Related to *Scolopendra occidentalis* Meinert, but differing as follows: Antennæ not strongly crassate at base; anal legs short and thick; spines along upper interior side of femora 5 or 6, in two series; along inner side 2–4, in one or two series; beneath 5–7, in two series; apical process absent or, when present, with the spine entire or bifid. The first 8 or 10 dorsal plates not margined.

Type.—Acc. 19099, U. S. Nat. Museum.

Habitat.—Sanatilla or Swan Island, Caribbean Sea; U. S. Fish Commission.

This species is described from eight rather badly preserved specimens.

21. Scolopendra crudelis Koch.

Acc. 17400, San Salvador, Bahama Islands; U. S. Fish Commission.

Numerous specimens.

22. Cormocephalus, sp. ?.

In the collection is a mutilated specimen without any definite locality.

23. Lithobius sulcipes Stuxberg.

1876.—*Lithobius sulcipes* Stuxberg. Öfvers. Vet.-Akad. Forh., 21 (*found at various places around mouth of Jenisey River, Siberia.*

No. 83. U. S. Nat. Museum, Bering Island; Stejneger.

24. Lithobius stejnegeri, sp. nov.

Diagnosis.—Related to *Lithobius sulcipes* Stuxberg, but the claw of ♀ genitalia tripartite; coxal pores more numerous.

Type.—Nos. (92 and) 93, U. S. Nat. Museum.

Habitat.—Bering Island, Topor Rof Island, and Gavaus Kaya Topka, Copper Island; Stejneger.

Description.—Yellowish brown, head and antennæ almost orange. Robust, moderately smooth, head of about equal length and width. Antennæ 20-jointed, short. Ocelli 12–18, in four or five series. Prosternal teeth 2+2. Coxal pores 3, 4, 3, 3–4, 5, 5, 4, round and large. Spines of first pair of legs 0, 1, 1 or 1, 1, 1; of penultimate pair 1, 3, 2, 1–1, 3, 3, 2; of anal pair 1, 3, 2, 6; spine at base of claw of penultimate pair two-thirds as long as claw. Anal legs of male normal; claw of female genitalia wide and short, tripartite, middle lobe only slightly larger, spines 2+2, inner slenderer and shorter. Length, 8–11^{mm}.

This species is described from a number of specimens from the above localities. I have the pleasure of naming this species after Dr. Leonhard Stejneger, of the U. S. Nat. Museum, who collected the specimens in 1882 and 1893.

25. Lithobius glabratus Koch.

Switzerland; E. D. Cope. Female.

26. Lithobius forficatus (Linnæus).

Switzerland; E. D. Cope. Several specimens, male and female.

27. Scutigera flavipes, sp. nov.

Diagnosis.—Similar to *S. guildingi* Newport, but the legs not banded, pure yellow; stomata not black, the region on each side whitish.

Type.—Acc 17400, U. S. Nat. Museum.

Habitat.—San Salvador, Bahamas; U. S. Fish Commission.

Description.—Blackish brown, a broad median yellow dorsal band, lateral parts of dorsal plates paler; stomata not black, the swelling on each side whitish, legs and antennæ yellow, not banded; median part of head yellow, with an irregular black line on each side. Body narrow, more strongly attenuated anteriorly; rather strongly convex. Dorsal plates rather smooth, spines weak, less prominent on anterior plates, not forming any prominent median dorsal series; lateral margins rather strongly elevated, hardly crenulate, spines more strongly developed on posterior segments; posterior margin not much produced nor deeply sinuate; last dorsal plate rather small, sides converging, posterior border entire. Cephalic plate with a triangular impression, anteriorly sulcate, longer than wide. Antennæ slightly more than twice as long as body. Carinæ of legs not very prominent, spines not numerous. Forceps of female genitalia mutilated, rather stout, a small bunch of stiff hairs on the inner side of the first article. Length of body, 25^{mm}; width (of fourth dorsal plate), 3.5^{mm}.

Described from a female of which the anal legs are lost and nearly all the others broken off.

INDIANA UNIVERSITY, *April 15, 1889.*

V.

OMISSIONS AND CORRECTIONS.

Page 43. *Lithobius "tyrranicus,"* as originally spelled (*Proc. U. S. Nat. Mus., 1887, p. 626*), is evidently a misprint, and it appears from Mr. Bollman's manuscripts that he intended to name the species "*L. tyrannus.*" The name ought to be changed accordingly.

Page 66. Add the descriptions (reprinted from *Entomol. Amer.*, II, *1887, p. 229*) of the following two species:

Family POLYDESMIDÆ Leach.

Genus PARADESMUS Saussure.

Paradesmus evides sp. nov.

Coloration as in *P. erythropygus.* Form more slender. Vertex smooth, median sulcus continuous, not much excavated between the antennæ. First segment more rounded. Inner angle of the lateral carinæ not serrated. Genitalia entirely different, short, robust, pilose, scarcely bent, grooved above at the end, and divided into two blunt lobes.

Length of body, 26^{mm}; width, 4^{mm}.

Habitat.—Winona, Minn.

I have examined one whole specimen and a number of broken ones collected by Prof. J. M. Holzinger. This species can be easily separated from *erythropygus* by the markings of the vertex, the smooth lateral carinæ and especially by the male genitalia.

Family GEOPHILIDÆ Leach.

Genus GEOPHILUS Leach.

Geophilus glaber sp. nov.

Olivaceous; head, antennæ, and mouth parts brown, an indistinct black, median dorsal line. Robust, attenuated posteriorly, not pilose, punctate; sternum wider than long; coxæ longer than wide (7:5), armed; claw moderately curved, teeth weak.

Cephalic plate large, narrowed behind, longer than wide (10:8); frontal plate present; basal plate more than twice as wide as long (10:4), partly covered by the cephalic plate. First joints of antennæ long. Anterior spiracle very large, oval; posterior small, nearly circular. Dorsal plates bisulcate; anterior predorsal plate small, posterior large; ventral plates with a median sulcus. Posterior coxæ not much swollen, pores above and below, large and small. Last ventral plate large, sides rounded, not converging much. Anal pore large. Last pair of feet of female slender. Pairs of feet of the female, 53–55.

Length of body, 50–53^{mm}; width, 2.5^{mm}.

Habitat.—Ukiah, Cal.

I have examined three females collected by Mr. James K. Burke.

Page 106, read *Scoterpes* instead *Scotherpes*.
Page 118, footnote, read "Karsch" instead "Kohlrausch."
Page 119, insert, after *Spirobolus californicus:*
Spirobolus hebes Bollman. Ann. N. Y. Ac. Sc., IV, 31 (1887); Entom. Amer., II, 228 (1887)—California.
Page 119, insert after *Parajulus diversifrons:*
Parajulus ectenes Bollman. Proc. U. S. Nat. Mus., 617 (1887).—North Carolina.
Page 120, insert after *Parajulus piloniscutus:*
Parajulus rugosus Bollman. Entom. Amer. III, 81 (1887).—Pennsylvania, Indiana.
Page 120, insert after *Parajulus varius:*
Parajulus zonatus Bollman. Proc. U. S. Nat. Mus., 618 (1887).—Washington.
Page 121, read *Scoterpes* instead *Scotherpes*.
Page 128, add as a synonym of *Lithobius bilabiatus:*
Lithobius tuber Bollman. Proc. U. S. Nat. Mus., 626 (1887).
Page 129. *Lithobius similis* Bollman is synonymous with *L. trilobus* Bollman (see p. 92).
Page 132, read *Fontaria virginiensis brunnea* instead *Fontaria virginiensis castanea*.

[The following paper by Mr. Bollman, published shortly before his death, was accidentally overlooked by the editor. It should follow page 111.]

[From Proc. Ac. Nat. Sc. Phil., 1889, pp. 127-129.]

NOTES ON A SMALL COLLECTION OF MYRIAPODS FROM THE BERMUDA ISLANDS.

BY CHARLES H. BOLLMAN.

The following species, which were collected by Prof. Heilprin in the summer of 1888, although limited in number, show the diverse origin of the Myriapod fauna of the Bermuda Islands. Heretofore *Julus moreleti* has only been found in the Azores Islands; *Mecistocephalus guildingii* in the West Indies; *Lithobius lapidicola* in Europe, and *Spirobolus heilprini*, by having scobina, shows its West Indian and not African origin, for all found in the latter continent belong to the subgenus *Spirobolus* from which scobina are absent.

These four species, including a specimen of *Scolopendra subspinipes* which I have in my collection, are all that as yet have been reported from the Bermuda Islands.

I desire to express my thanks to Prof. Angelo Heilprin, of the Academy of National Sciences of Philadelphia, for the privilege of examining this collection of Myriapods.

1. Spirobolus Heilprini, sp. nov.

Diag.—Related to *Spirobolus flavocinctus* Karsch, but the segments very distinctly segmented, anterior part not striate; antennae and legs reddish brown.

Type.—Museum Academy National Science, Philadelphia. Greenish-black, posterior margin of segments rufous, antennae and legs reddish-brown. Slender, anterior segments scarcely attenuated. Vertex

smooth, sulcus shallow; clypeus only moderately emarginate, foveolæ 2+2, distant, sulcus sub-continuous with vertical. Antennae rather slender, reaching second segment in both sexes. Ocelli arranged in a suboval or subtriangular patch, 45–55, in seven or eight series. Segments not smooth; posterior parts above with short and wavy, beneath with short and straight striae; median part with a transverse sulcus which ends above repugnatorial pore; posteriorly above with a few striae, beneath almost smooth or with a few weak oblique striae. Lateral lobes of first segment rounded, a weak marginal sulcus. Anal segment with a flat, thick mucro, which passes beyond valves; anal valves weakly margined, not punctate; anal scale obtusely angled. Repugnatorial pores placed on anterior division, small and rather deep set. Legs extending slightly beyond sides of body. Male: Slenderer than female; coxæ of 3d, 4th, 5th, pairs of legs produced into short lobes; tibia and first two tarsal joints beneath with an oval roughened lobe; joints of anterior legs short and thick, third and fourth pairs of legs strongest; tarsi without a pad; ventral plate of copulation-foot triangular as high as foot, its base not concave, its posterior surface ridged, thus making the plate of a triangular-pyramidal form; anterior part of first foot not as high as ventral plate, triangularly pointed, the ventral plate ridge separating them; posterior part of anterior foot as high as ventral plate, its apex with a short blunt lobe on its posterior surface; posterior copulation-foot bifid, projecting out of the opening, the upper branches flattened and fan-shaped at its end, which is convex; lower branch elongate-lanceolate, its upper edge serrate, basal part of foot rectangular and white, while the upper part is yellowish. Segments male, 46; female, 44. Length 52 mm, width 3. 8 mm–4. 2 mm.

This species is described from six broken and badly preserved specimens. In the type of copulation-foot it resembles that of *arboreus* and *dugesi*, and it is very probable that all the species belonging to this group have the same type, *i. e.*, the ventral plate triangular and as high as posterior part of anterior part, while the anterior part is less, the posterior foot bifid and projecting out of the opening.

I have named this species after Prof. Angelo Heilprin, of the Academy of Natural Sciences of Philadelphia.

2. Julus Moreleti Lucas.

In the collection are a number of female specimens which I refer to this species. It has only been found in the Azores Islands.

These specimens have the striæ of the anterior division of the segments not so irregular as represented in Porath's figure of this species.*

Segments 42–49. Adult almost black, legs reddish brown; young dusky, with a lateral row of black spots and a medium black dorsal line, bordered with yellowish.

*Am. nagra Myriopoder frau Azorerna. Öfver. Kongl. Vet. Akad. Forh., Stockh., 820, 1870.

3. Mecistocephalus guildingii Newport.

Three specimens. These are so moulded and broken that it is almost impossible to make much out; but in the characters of the head, they seem to be identical with the West Indian species.

4. Lithobius lapidicola Meinert.

Two specimens, male and female. Joints of antennæ 26; ocelli 8 or 9, in three series; coxal pores male 2, 3, 3, 2, female 3, 4, 4, 3; spines of first pair of legs, 0, 1, 1; of penultimate pair, 1, 3, 3, 1; of anal pair, 1, 3, 2, 0; spines of female genitalia stout, claw very distinctly tripartite, middle lobe not much longer; length male 7 mm; female 8 mm.

It is very probable that these specimens are not identical with *L. lapidicola*, a European species; but as they are rather mutilated I have hesitated to describe them as new.

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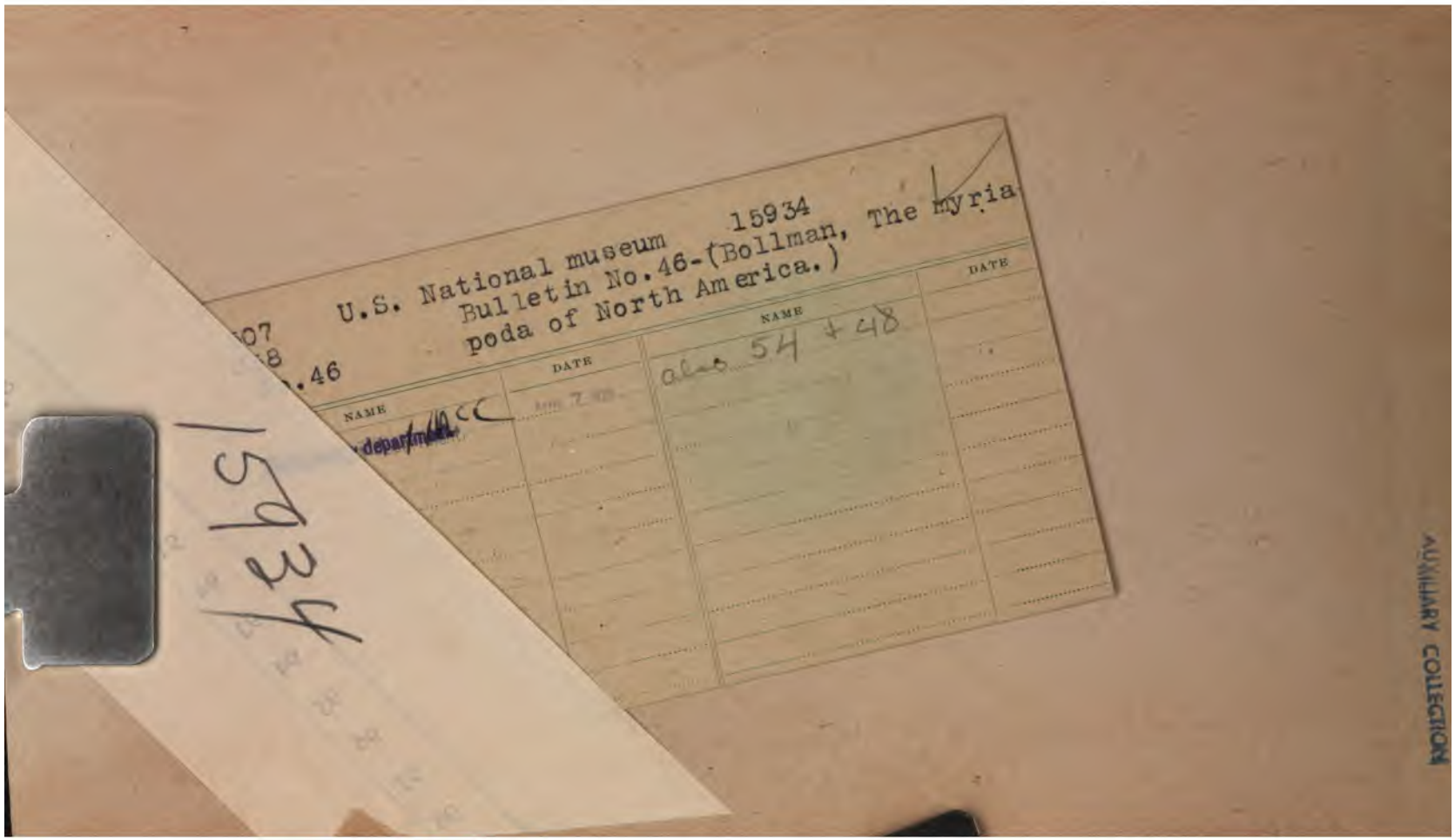
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